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UNITED'S NEXT JOB

Picking the oil fields from 3,285,319 sq. miles of unexplored territory!

UNITED GEOPHYSICAL COMPANY has been selected by the Brazilian Government to conduct one of the greatest seismic exploration programs ever undertaken—a survey of the oil possibilities of Brazil... a country composed of over 3¼ million square miles of land!

UNITED is proud to have been chosen by Brazil for this work—and for the great confidence shown in the ability of its field crews. Trained, experienced, and employing every modern facility for accurate and scientific prospecting... and backed by highly successful results in the United States, New Zealand, Argentina, and Trinidad... UNITED crews are fully equipped for this immense geophysical job.

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REFINERY RUNS - BBL. DAILY

3,800

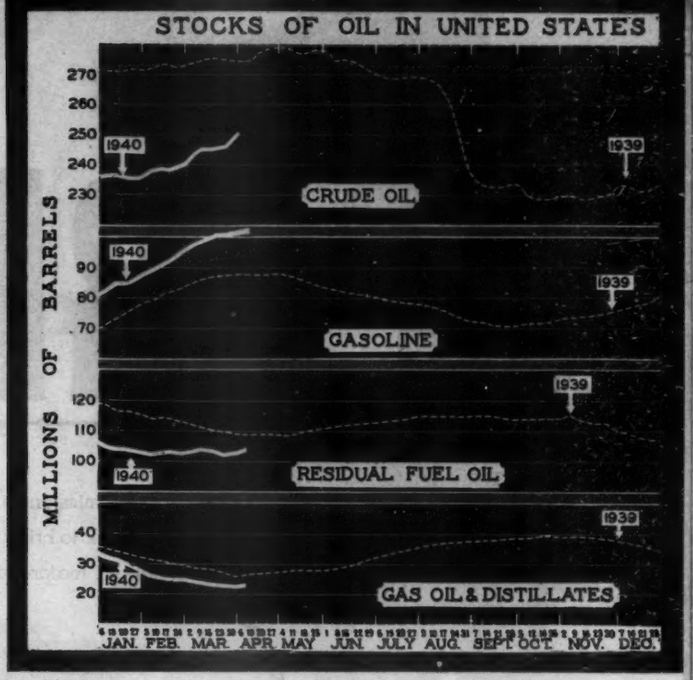
3,400

3,000

2,600

Trends

Developments Point To Lower Crude-Oil Production in May



THE most important developments of the week east of California centered in the Oklahoma City meeting of the Interstate Oil Compact Commission. The meeting generated a frank discussion of conditions in the industry with general agreement as to operating schedules needed to assure satisfactory trends over the next 6 months.

CRUDE PRODUCTION *3,754,738 bbl. daily aerage — down 100,549 bbl. One year ago 3,445,197 bbl.*

CRUDE STOCKS *250,561,000 bbl. as of March 30—up 3,160,000 bbl. One year ago 276,119,000 bbl.*

GASOLINE STOCKS *101,690,000 bbl. as of April 6—up 320,000 bbl. One year ago 87,189,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *105,099,000 bbl. as of April 6 — up 2,018,000. One year ago 108,968,000 bbl.*

GAS OIL AND DISTILLATES *23,551,000 bbl. as of April 6 — up 273,000. One year ago 25,994,000 bbl.*

REFINERY RUNS *3,455,000 bbl. daily week ended April 6—down 130,000 bbl. One year ago 3,145,000 bbl.*

Statisticians offered convincing evidence that failure of several states to keep their allowables within the Bureau of Mines estimates of demand in recent months had been ill advised and if continued would precipitate a market crisis. These analysts were conservative as to the demand for domestic crude throughout the remainder of the year. They pointed out that in projecting operations to September 30 it is necessary to take into consideration four factors: (1) Domestic demand will not show the percentage increase it did in the last quarter of 1939 and the first quarter of this year; (2) exports will continue to lag and imports increase; (3) excessive operations in recent months have resulted in excess gasoline stocks which will have to be reduced, thus restricting refinery operations through spring and summer months; (4) the assured increase in Illinois production will absorb a large part of the increased domestic demand for crude this year. This means that the production of several states will have to be kept to last year's levels.

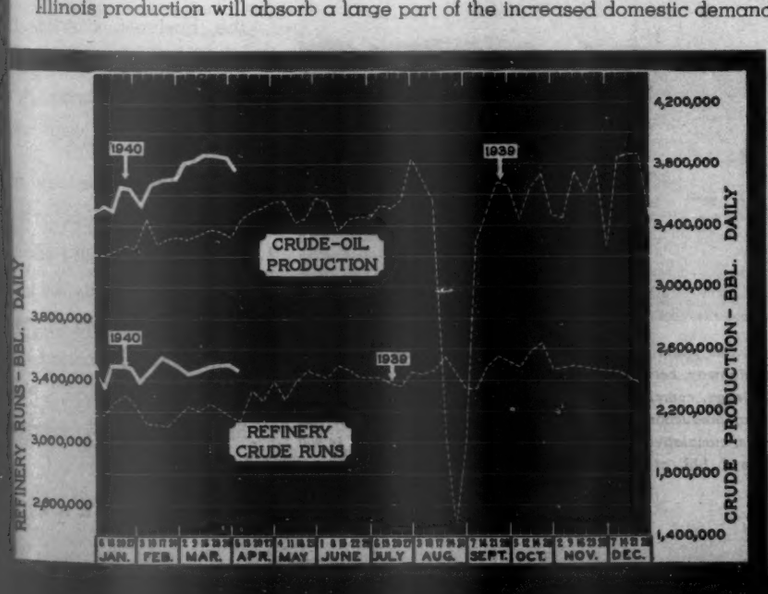
If recommendations made at this meeting are carried out, May domestic production will be reduced to around 3,600,000 bbl. daily and will not exceed 3,700,000 bbl. daily during the late summer and fall months. Assurance was given that Texas' May production would be in line with the B. of M. recommendations.

Developments in markets so far this month indicate the need of an operating program for the next few months as outlined at Oklahoma City. There are scattered indications of surplus crude oil in southwestern states, and refinery markets generally are dull. While domestic gasoline consumption is running substantially ahead of last year, the large stocks and high current rate of production have resulted in a weak market situation at most points.

Exporters the first of the week were closely watching the changing war fronts in Europe attempting to gage its probable effects on shipments from this country. Norway is the third largest factor in number of oil tankers and it has held a key position in the movement of petroleum products to the Allies and many neutrals since the war started. It was pointed out that with Norway an active participant in the war some adjustment in these shipments will be necessary. The export market at the Gulf continues slow and the market for both refinery and natural gasolines is weak.

DAILY AVERAGE PRODUCTION FOR WEEK

	Apr. 6, 1940	Bur. Mines Apr. est. of demand	Apr. state allowables	Mar. 30, 1940
Oklahoma City	102,500	.....	.....	89,450
Seminole field	39,525	.....	.....	39,875
Remainder of state	278,750	.....	.....	283,800
Total Oklahoma	420,775	413,000	413,000	413,125
East Texas	396,889	.....	.....	396,900
West Texas	244,357	.....	.....	276,642
North Central Texas	132,884	.....	.....	138,491
Texas Panhandle	80,293	.....	.....	82,205
East Central Texas	82,146	.....	.....	91,150
Gulf Coast Texas	362,466	.....	.....	409,403
Southwest Texas	95,398	.....	.....	116,000
Total Texas	1,394,433	1,332,000	1,513,921	1,510,791
North Louisiana	68,010	.....	.....	68,825
Gulf Coast Louisiana	214,698	.....	.....	212,900
Total Louisiana	282,708	257,000	284,133	281,725
California	601,750	590,000	592,000	591,850
Kansas	175,350	151,000	151,000	180,400
Arkansas	69,250	64,500	70,000	68,980
Mississippi	8,490	3,900	.....	7,825
Eastern fields	107,100	109,300	.....	107,400
Illinois	427,406	380,000	.....	424,720
Michigan	63,306	63,000	.....	64,291
New Mexico	114,610	100,000	114,000	114,720
Rocky Mountain area	89,560	86,300	.....	89,460
Total United States	3,754,738	3,550,000	.....	3,855,287


CRUDE-OIL PRODUCTION
REFINERY CRUDE RUNS
1940
1939
REFINERY RUNS - BBL. DAILY
CRUDE PRODUCTION - BBL. DAILY
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

SPARKS . . FROM THE NEWS

MAJOR NEED: The Interstate Oil Compact Commission at Oklahoma City inaugurated a program which will seek to bring about uniform proration practices for the oil states—a major need in coordinating state conservation programs.

LESSON LEARNED: After experimenting with the policy of ignoring Bureau of Mines recommendations with unsatisfactory results, it now appears that regulatory bodies in most states will keep their May output within the demand estimates.

CONTRACT: Airlines are exulting over their first year completed without a fatality. On the heels of this boast comes the news that one company has just signed the largest single contract ever placed for gasoline, the figure being 11,000,000 gal., or 33,000 tons.

PROFITS: Motorists are reported to be getting East Texas gasoline at 9 cents a gallon. With 5 cents deducted for taxes and with crude costing 3 cents a gallon at the refinery, that leaves 1 cent to be divided among the refiner, the jobber, and the dealer.

NO ANSWER: A question we can't answer even to our own satisfaction is why natural gasoline is bringing 52 to 65 cents per barrel at Texas plants and crude oil in the same area is selling for $1 to $1.10 per barrel at the wells.

EXPOSITION: Although the event is still a month away, plans for the International Oil Exposition at Tulsa are rapidly taking shape, with prospects for the most complete show ever held.

FASHION NOTE: A new kind of winter coat for tender plants is provided by a petroleum-alcohol emulsion applied as a spray. It is reported to form a tight garment that protects from freezing.

SAFETY: Further evidence that, despite the seeming hazards, gasoline plants are among the safest for workmen is afforded in the announcement by a major company that two of its plants have just completed 10 years without a single disabling injury.

ACTIVITY: First reports of new drilling activity in central and western Kansas are increasing weekly, and it looks as though the Sunflower State will have more field work this summer than at any time since the Illinois boom hit its stride.

OIL WAR SPREADS: The spread of the European war will emphasize the importance of oil. Norway, with approximately 265 tankers, ranks third in oil transportation. Netherlands, now surrounded by belligerents, ranks fourth with 110.

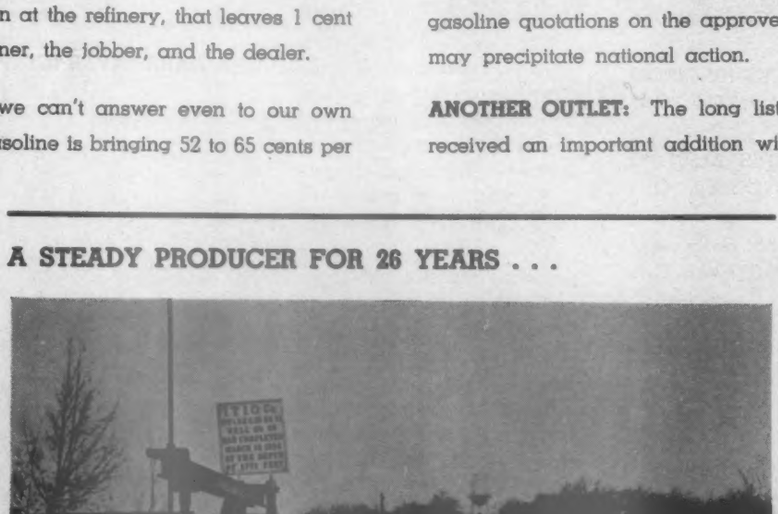
END CONFUSION: The W.P.R.A. meeting approved the A.S.T.M. method and this week many of the membership started basing gasoline quotations on the approved method. This development may precipitate national action.

ANOTHER OUTLET: The long list of products from petroleum received an important addition with the announcement that a unit to manufacture rubber from refinery gases will be built immediately at a Louisiana refinery.

ENCROACHING: If the current drilling activity at Oklahoma City approaches much nearer the business district, it will be necessary to raze business buildings to make room for derricks.

NEW LIFE: The tonic of spring is eliminating winter's depressing effect in the Forest City basin, with new drilling operations getting started in Missouri, Kansas, Nebraska, and Iowa sectors of the basin.

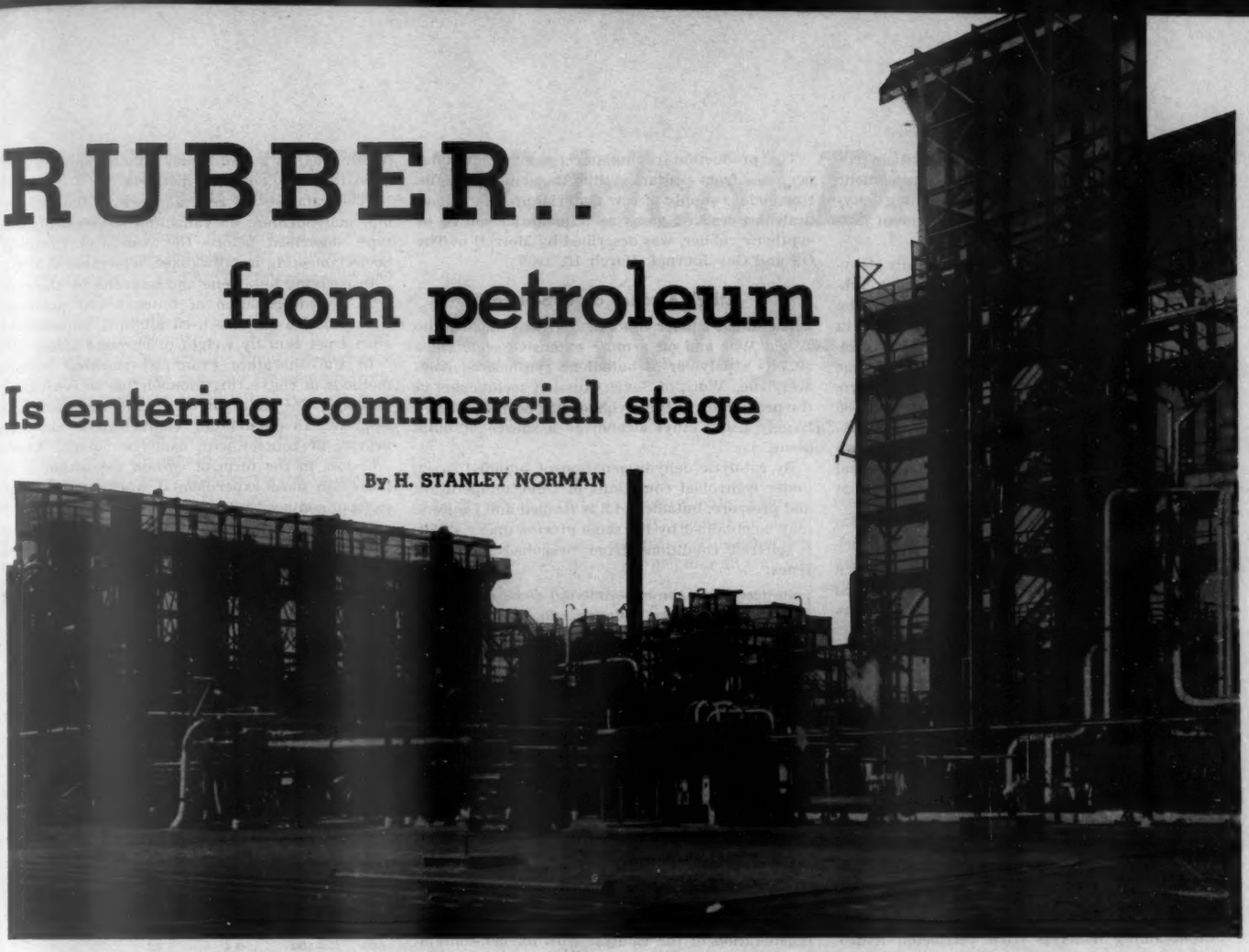
A STEADY PRODUCER FOR 26 YEARS . . .



Reminiscent of boom days in the Osage, this pump jack stands in the middle of the main street of Barnsdall, Okla., at the turn of the highway between Tulsa and Pawhuska. It is the Indian Territory Illuminating Oil Co.'s No. 20 Osage, completed March 18, 1914, in Bartlesville sand at 1,848-1,771 ft., total depth, and had initial production of 70 bbl. of oil daily after a shot. It has produced oil steadily for the last 26 years, cumulative production on January 1, 1940, being 14,900 bbl. It continues to produce 1 bbl. of oil and 3 bbl. of water daily

RUBBER..
from petroleum
Is entering commercial stage

By H. STANLEY NORMAN



Motor fuel of exceptionally high antiknock quality is produced in these coils and towers at the Esso Marketers Bayway refinery. Other products, such as heating oil, fuel oil, gas and coke are also recovered here

THE United States petroleum-refining industry is nearing the commercial-production stage of another basic raw material—rubber. Petroleum chemists have known for years that refinery and natural gases contained hydrocarbons from which rubber can be synthesized, but until recently economic considerations have outweighed the inherent advantages of synthetic rubber over the natural product in certain and, so far, restricted applications.

Until the second European war started, sufficient synthetic rubber to meet the restricted requirements was available in Germany. The limited supplies of synthetic rubber imported from Germany were used experimentally in services where abrasion and decomposition, particularly in oil and other solvents, placed natural rubber at a disadvantage.

Recently information was released announcing that Standard Oil Co. of New Jersey owns American rights to the Buna synthetic rubber developed by the I.G. Farbenindustrie of Germany.

In an authorized statement printed in the current issue of "The Lamp," a company publication, Standard of New Jersey explained its position in regard to Buna rubber as follows:

Preliminary Research

"First of all, it should be emphasized that plans to produce Buna rubber commercially in the United States are in the early stages of development. There is no thought that this project will result in any sudden displacement of a major supply of the natural product. Experience has shown that in a development of this kind the normal commercial procedure of gradual expansion is the sound course to follow.

"Buna is considered to be the most important commercial development to date in a long series of technical steps toward the present goal of synthetic-rubber research; namely, a group of synthetic-rubber products, each of which in its field will equal or better all the properties of natural rubber at prices competitive with those of the natural product. Unlike most new developments, Buna has the advantage of having already been tested in actual use. Its use in large commercial quantities in Germany makes certain that the synthetic product is at least as good, and in many respects better, than natural rubber for many uses.

"The initial production of Buna in the United States will be used for specialty purposes where it has real advantages over natural rubber. In time Buna may be found economically suited to the manufacture of automobile tires in the United States. Under somewhat different conditions, Buna may be used successfully in Germany for tires on an increasing scale over the next 2 years.

"It remains to be seen whether, with increased production under American conditions and with the United States' abundant supply of raw material, the lower costs which usually accompany increased output, and further improvement of properties in which it already surpasses natural rubber will permit its use in tires.

"To produce Buna from petroleum the manufacture of butadiene, which is the basic raw material, is an important part of the process. In fact, capital expenditures for the butadiene part of a plant will be on the average greater than for facilities actually to convert this basic material into synthetic rubber.

"It is possible, however, to produce butadiene in one locality and transport it elsewhere for conversion into the finished synthetic product. For that reason, some American rubber companies are investigating the possibility of having raw materials shipped to their plants for manufacture, rather than purchase the finished product at an oil refinery."

There is no information yet available indicating where the first plant for the commercial production of butadiene will be located, but either the Gulf or the East Coast is the logical selection. Neither is information available as to when the Buna rubber will become available to American rubber manufacturers.

Slow Development Planned

Although development is planned on a basis of gradual expansion, the petroleum industry in this country is potentially capable of more than meeting the domestic demand for rubber, a demand which last year approximated 600,000 tons.

Modern development of synthetic rubber dates from about 1927 when German chemists found that butadiene was obtainable commercially from coal and limestone. The original Buna rubber was made by polymerizing butadiene using sodium at one stage of the process and thus accounting for the name "Buna" which is derived from Bu for butadiene and Na for natrium, the German word for sodium.

In modern practice butadiene is combined with acryl-nitrile and styrene, both of which are available from petroleum hydrocarbons. Combination of butadiene and acryl-nitrile is called "Buna-N" and it has most of the desirable properties of natural rubber. In resistance to heat, abrasion, aging, and swelling in gasoline and oil the Buna-N is vastly superior to the natural rubber.

There has been no disclosure of the particular steps Standard Oil of New Jersey will adopt for production of butadiene and it is probable that several of the presently known methods will be adapted to suit conditions as they vary.

Production of butadiene by catalytic dehydro-

genation of *n*-butane is described in British patent No. 41646 issued to Standard Oil Development Co., as involving two steps; first, obtaining butylene at slight pressure and then butadiene at normal or reduced pressure.

In the first step *n*-butane is catalytically dehydrogenated forming butylene, but without substantial formation of butadiene. A portion of the butylene is also catalytically dehydrogenated in the second step forming butadiene which is removed and the remaining hydrocarbons of four carbon atoms is recirculated. The first dehydrogenation step is carried out at a pressure of 25-80 lb. per sq. in. at a temperature of 900-1,000° F., and to an extent of conversion of 20-60 per cent per pass. The second step is carried out at normal or reduced pressure and at a temperature of 1,000° to 1,200° F.

Residual Butylene Polymerized

After removal of the butadiene, the residual butylene may be polymerized, the unpolymerized hydrocarbons separated therefrom and recirculated to the first step and the butylene depolymerized and recirculated to the second step. A suitable catalyst for the dehydrogenation is chromium oxide on activated alumina. Butadiene is removed by extraction of the liquid hydrocarbons with liquid ammonia or ethylene glycol, or by absorption from the gases by acid cuprous chloride.

So far as literature published up to the present is concerned it seems that butane, propylene and cyclohexane are the materials best suited as the starting point for production of butadiene by pyrolysis. Most of the methods for producing butadiene by pyrolysis involve thermal treatment at temperatures ranging from 450° to 800° C. under atmospheric or reduced pressure.

In obtaining diolefins from petroleum hydrocarbons (particularly those boiling above 150° C. and containing 10 to 20 carbon atoms per molecule) the products of pyrolysis are rapidly cooled to retard further reaction and to condense the hydrocarbons. Butadiene may be separated from other diolefins resulting from pyrolitic treatment by cooling and compression, by absorption in cooled low-cold-test gas oil, or by the action of various reagents such as solutions of mercuric salts or liquid sulfur dioxide.

Butadiene-1,3 ($CH_2=CHCH=CH_2$), usually called simply butadiene, is described by Ellis in "The Chemistry of Hydrocarbon Derivatives" as typical of the type of unsaturated linkage which has a tendency to polymerize to substances of high molecular weight and consequently lends itself particularly well to the production of so-called synthetic rubbers.

"Butadiene," writes Ellis, "is an important intermediate in the formation of cyclic, particularly aromatic, hydrocarbons in thermal processes. It occurs to the extent of about 2 per cent in the gases from commercial vapor-phase cracking operations, but apparently it is formed to only a trifling extent during liquid-phase cracking at lower temperatures."

The almost universal appearance of butadiene in the gaseous products of pyrolysis of all types of hydrocarbons at temperatures immediately below those at which aromatic hydrocarbon formation becomes marked, makes it an important intermediate in the transformation of straight-chain hydrocarbons into aromatics.

One of the connecting links potentially open to the petroleum refining industry for the production of butadiene from butenes and isoprene from pentenes is the catalytic dehydrogenation process, a step described by Aristid V. Grosse, J. C. Morrell and Julian M. Mavity, of Universal Oil Products Co., before the forum at Boston on plastics and resins from hydrocarbon sponsored by the American Chemical Society.

The production of butenes from butanes and pentenes from pentanes, thus throwing open the tremendous supply of raw material present in natural and cracked gases as a potential source of synthetic rubber, was described by Morrell in The Oil and Gas Journal, March 16, 1939.

Ethyl Alcohol as a Source

The Buna rubber used in Germany during the World War and on a more extensive scale since 1927 is a polymer of butadiene synthesized from acetylene. Work of Soviet Russian technicians in the production of Buna rubber has been developed largely using ethyl alcohol as a source of butadiene.

By catalytic dehydrogenation of butene-1 or -2, under controlled conditions of time, temperature and pressure, butadiene-1,3 is formed and isoprene may be obtained by the same process under slightly altered conditions from branched-chain pentenes.

In describing the experimental work of producing butadiene from butenes and isoprene from pentenes, Grosse, Morrell and Mavity reported to the symposium on plastics and resins at Boston last September, as follows: "The dehydrogenations were carried out by passing the charge at a definite rate through a section of granular catalyst in a quartz tube. The catalyst zone was heated in constant temperature zone of an electrically heated aluminum bronze block furnace. Condensable products were collected in dry ice traps, while noncondensable gases were pumped from the system by means of a Nelson vacuum pump which permitted metering and sampling for analysis. The pressure was automatically controlled by means of a solenoid valve arrangement. For continuous operation, involving intermittent regeneration of the catalyst with oxygen-containing gases, the procedure is similar to that described by the dehydrogenation of paraffins by Morrell in The Oil and Gas Journal, March 16, 1939.

"The condensed reaction products were usually fractionated in a Podbielniak column and the cuts investigated by chemical methods.

"The catalysts in general were of the chromium, molybdenum, or vanadium oxide-on-alumina type, described before the American Chemical Society meeting in Milwaukee September 6, 1938."

In deriving butadiene and isoprene by the catalytic dehydrogenation of butenes and pentenes, Grosse and associates used alumina impregnated with 4 per cent by weight of chromic oxide.

In the literature examined showing various methods of converting monoolefins to conjugated diolefins, the series in which fall butadiene and isoprene, an outstanding characteristic has been brevity of contact with catalytic agents. Excessive loss in the form of carbon deposition is reported in most experimental work involving periods of contact beyond fractions of a second.

In summarizing the results of experimental work reported upon last fall in Boston, Grosse, Morrell and Mavity had this to say:

"Monoolefins have been dehydrogenated catalytically to give conjugated diolefins of the same carbon framework. The diolefins formed were butadiene-1,3 from *n*-butylenes, isoprene from the branched-chain pentenes and piperylene from pentene-2. The once-through yields varied from 20 to 30 per cent, and ultimate yields of butadiene-1,3 up to 80 per cent were obtained. Cyclopentadiene was obtained by dehydrogenating cyclopentane."

The following table giving results of dehydrogenation of *n*-butylenes is after Grosse, Morrell and Mavity:

Temperature °C	Press. mm.	Contact time, sec.	Yield of butadiene-1,3 wt. per cent Single pass	Recycle	Mol. % of charge converted to carbon
600	190	0.7	22	42	..
600	190	0.75	18	36	..
600	190	0.4	22	..	5.9
600	168	0.34	20	49	5.4
*600	197	0.12	13.5	54	1.7
600	198	0.045	11.2	62	0.9
650	192	0.068	21.8	53	2.6
650	192	0.055	19.3	56	2.4
650	189	0.041	16.6	60	1.6
650	180	0.028	13.3	69	1.0
650	168	0.018	11.9	79	0.6
650	63	0.026	21.8	51	1.0
650	63	0.019	18	60	0.9
650	63	0.013	17.0	65	0.6
650	80	0.012	14.7	69	0.5

*Average of 3 experiments.

STANDARD OIL OF LOUISIANA WILL BUILD SYNTHETIC-RUBBER PLANT AT BATON ROUGE

NEW YORK, Apr. 8.—Standard Oil Co. of Louisiana will construct the first Buna synthetic-rubber plant in the United States at Baton Rouge where the essential hydrocarbons for the Standard Oil Development Co.'s process will be available in the form of refinery gases. The Standard of Louisiana plant will have daily capacity of 10,000 lb. of synthetic rubber.

In announcing the agreement between Standard Oil Development and the Standard of Louisiana, both subsidiaries of Standard Oil Co. of New Jersey, covering the manufacturing process, it was said that Firestone Tire & Rubber Co., Akron, Ohio, has obtained a license to manufacture its own requirements of Buna.

The statement said that it is understood that Firestone will be prepared to produce on a small basis in the immediate future. It is not yet known, however, whether Firestone will erect a large plant of its own or will draw its principal supplies from the Baton Rouge plant, which is expected to begin operations the latter part of this year.

One of the other leading rubber companies has informed the Standard Oil Development Co. that it will draw its supplies of Buna from the Baton Rouge plant, and this plant will also furnish the requirements of the large number of manufacturers of rubber specialties which have been using the imported Buna, supplies of which have been cut off since the European war began.

Dr. R. R. Sayers Named Temporary Head of Bureau of Mines

WASHINGTON, D. C., Apr. 8.—President Roosevelt has detailed Dr. R. R. Sayers, chief of the health and safety branch of the Bureau of Mines from 1917 to 1932, as acting director of the Bureau of Mines.

Dr. Sayers is senior surgeon of the United States Public Health Service, in which he entered in 1914. The detailing of Dr. Sayers as acting director was taken upon recommendation of Secretary Ickes. He was born in Crothersville, Ind., and received degrees from the University of Indiana and University of Buffalo. He served as a chemist in industry and as professor of electrochemistry at the University of Buffalo. Since 1932 Dr. Sayers has been in charge of the office of industrial hygiene and sanitation for the Public Health Service. He is a member of the American Institute of Mining and Metallurgical Engineers and American Gas Association.

Stanolind Oil Challenges Capital-Stock Tax Levy

Stanolind Oil & Gas Co. and two affiliates filed in federal court at Oklahoma City, Okla., last week a brief contending the Government's capital-stock tax levy is unconstitutional, in violation of the fifth and fourteenth amendments and is not a tax but a "confiscation" by the Government.

Federal Judge Edgar S. Vaught, who ordered the case filed on briefs 30 days ago, is expected to make a decision shortly.

Wildcat Drilling Activity--1939

By FREDERIC H. LAHEE
Chief Geologist, Sun Oil Co.*

IN 1939 wildcat drilling was not as intensive as it was in 1938, and fewer pools were discovered. During 1939, in the states covered by this report, 2,319 dry holes and 270 producers (oil and gas) were drilled as wildcats. Footage drilled was 8,624,602 ft.

This paper reviews data on wildcat drilling for the fifth consecutive year.† The states covered are indicated in Fig. 1.

Again, in compiling the data, we have tried to adhere to the definition of a wildcat as a hole drilled completely outside the known boundaries of pools already developed, and far enough from producing areas to be essentially a test of new possibilities. Such a hole would usually be at least 2 or 3 miles from production, but, where subsurface conditions may change in short distances and where predictions from the known may turn out to be greatly in error, a test hole may be regarded as a wildcat even if it is only one-half or three-quarters of a mile from production. This is notably true of salt domes. The term includes all true discoveries of new pools. Where a well in a developed pool has been deepened in search of unknown deeper possibilities, the footage below the old pay sand has been regarded as "wildcat footage"—dry footage if no new pay was found, and discovery footage if commercial oil or gas was encountered. However, the total of this class of drilled wildcat footage is a very small percentage of the whole.

*Part of paper presented before American Association of Petroleum Geologists, to be published in the Bulletin of the A.A.P.G. in June.

†See A.A.P.G. Bulletin, Vol. 21, pp. 1079-82; Vol. 22, pp. 645-48; Vol. 22, pp. 1231-35; Vol. 22, p. 1236; and Vol. 23, pp. 789-94.

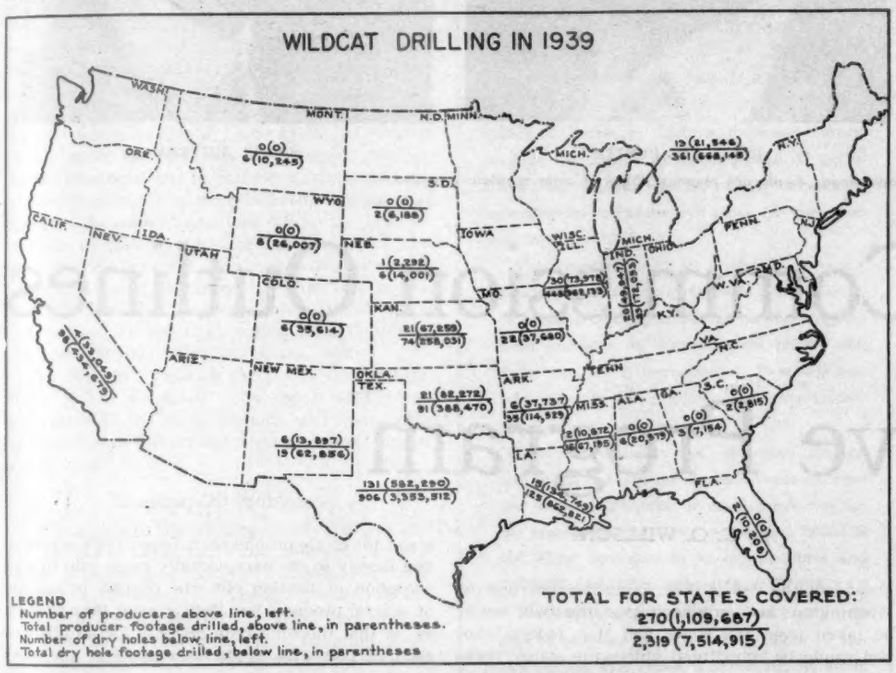


Fig. 1.—Showing extent of wildcat drilling operations in 1939

In the states covered in this review, as listed in Table 1, during 1939 a total of 8,624,602 ft. was drilled in 2,589 holes, divided as follows:

	Feet
270 producers	1,109,627
2,319 dry holes	7,514,915

This means that 10.43 per cent of the holes drilled, and 12.87 per cent of the footage drilled, was successful. The average depth of hole was 3,331 ft.

In the southern states district in 1939, 5,281,014 ft. was drilled in 1,274 holes, divided as follows:

	Feet
161 producers	779,345
1,113 dry holes	4,501,669

In this area, then, 12.63 per cent of the holes drilled, and 14.75 per cent of the footage drilled, was successful. Average depth of hole was 4,145 ft.

Selection of the location for a wildcat well may be based on geology (surface geology, subsurface geology, trend along known structural or stratigraphic conditions, local or regional, or shallow exploratory drilling); or it may be based on geophysics (exploration by seismograph, torsion balance, gravity meter, magnetometer, etc.); or it may be based on some nontechnical suggestion or requirement, such as "creekology," "hunch," "doodlebug," promotion, lease obligation, reported showings of oil or gas in holes previously drilled, etc. In many cases the reason for choosing the location cannot be ascertained.

According to the figures, 217 wildcats drilled on technical advice (geology and/or geophysics) were successful (oil or gas), and 1,446 were dry; 43 holes located for nontechnical reasons were producers, and 666 were dry; 10 producers and 207 dry holes were located for reasons unknown. These figures show that 13 per cent of the holes drilled on technical advice were producers as contrasted with 6 per cent successful in the case of the holes located without technical advice. Therefore, in 1939, as also in 1938 (see p. 793, Bull. A.A.P.G., Vol. 23), locations based on technical recommendations were more than twice as successful as those drilled without such advice. In the southern states, 9.5 per cent of the wildcats, located without technical advice, were producers, whereas 14.7 per cent of the holes located on technical advice were producers.

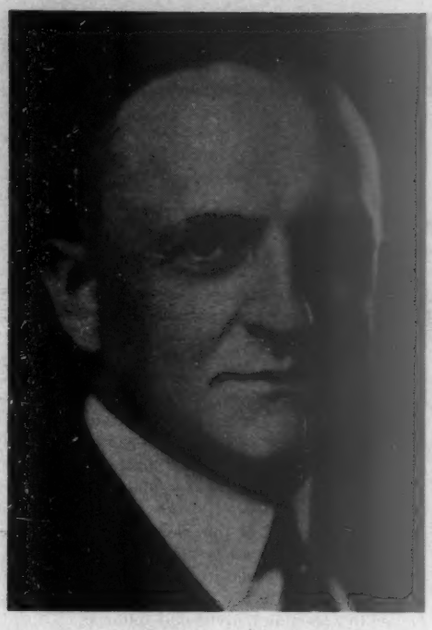
As we have pointed out in previous reports of this kind, the relatively low percentage of wildcat successes contrasted with wildcat failures is a measure of the difficulties inherent in geological (including geophysical) interpretation; for geology is not, and never can be, a precise science. We do find, however, that the holes located on technical advice were from 1.5 to 2.2 times as successful as those drilled without such advice.

TABLE 1—NUMBER OF OIL WELLS, GAS WELLS, AND DRY HOLES DRILLED AS WILDCATS IN 1939

States—	Oil: Number of holes	Oil: Footage drilled	Gas: No. of holes	Gas: Footage drilled	Dry: Number of holes	Dry: Footage drilled	Total No. of holes	Total footage drilled
Alabama	..	..	..	..	6	20,579	6	20,579
Arkansas	5	36,119	1	1,618	35	114,529	41	152,266
California	4	33,049	..	..	98	434,679	102	467,728
Colorado	..	..	..	..	6	35,614	6	35,614
Florida	..	..	..	..	2	10,208	2	10,208
Georgia	..	..	..	..	3	7,154	3	7,154
Illinois	29	70,986	1	2,992	448	962,133	478	1,036,111
Indiana	17	47,822½	3	2,124½	83	172,053	103	222,000
Kansas	19	63,017	2	4,242	74	258,031	95	325,290
Louisiana	8	84,402	7	50,347	125	862,821	140	997,570
Michigan	12	19,521	1	2,025	361	668,145	374	689,691
Mississippi	2	10,672	..	..	16	67,195	18	77,867
Missouri	..	..	..	..	22	37,680	22	37,680
Montana	..	..	..	..	6	10,245	6	10,245
Nebraska	1	2,292	..	..	6	14,001	7	16,293
New Mexico	6	13,897	..	..	19	62,856	25	76,753
Oklahoma	17	64,386	4	17,886	91	388,470	112	470,742
South Carolina	..	..	..	..	2	2,815	2	2,815
South Dakota	..	..	..	..	2	6,188	2	6,188
Texas	104	467,277	27	115,013	906	3,353,512	1,036	3,935,802
Wyoming	..	..	..	..	8	26,007	8	26,007
Total	224	913,440	46	196,247	2,319	7,514,915	2,589	8,624,602

TABLE 2—STATISTICS, GULF COASTAL PLAIN STATES EXCEPT NORTH CENTRAL TEXAS AND PANHANDLE

	Producers drilled: Holes: Number	Producers drilled: Holes: Per cent	Producers drilled: Footage: Feet	Producers drilled: Footage: Per cent	Dry holes drilled: Holes: Number	Dry holes drilled: Holes: Per cent	Dry holes drilled: Footage: Feet	Dry holes drilled: Footage: Per cent	Total number wildcats drilled	Average depth of hole (ft.)	Number of dry-hole feet drilled for each producer foot
1938	200	13.6	984,262	17.4	1,271	86.4	4,667,402	82.6	1,471	3,842	4.74
1939	161	12.6	779,345	14.8	1,113	87.4	4,501,669	85.2	1,274	4,145	5.90



W. R. BOYD, JR.

JUDGE J. C. HUNTER

FRANK BUTTRAM

Associations' heads emphasize responsibilities of state regulatory bodies

Compact Commission Outlines Constructive Program

By C. O. WILLSON

OKLAHOMA CITY, Okla., Apr. 5.—"The regulatory bodies of the states have the ball. I sincerely hope they will not fumble it."

Thus did Frank Buttram, independent operator of this city and president of the Independent Petroleum Association of America, place the responsibility for any future overproduction of crude oil in the hands of representatives of the oil states gathered here today in a regular quarterly meeting of the Interstate Oil Compact Commission.

Speaking at the request of Gov. Leon C. Phillips of Oklahoma, who was presiding as chairman for the first time since his recent election to that office, the I.P.A.A. executive head did not mince words in his brief discussion of responsibility for unwanted trends in the industry's recent operations and in explaining what has to be done in correcting those conditions if serious consequences are to be avoided.

"As I see it," Mr. Buttram said, "it is absolutely essential that the individual regulatory bodies in the different oil-producing states take immediate steps to reduce production to consumptive demand by limiting reductions to at least the Bureau of Mines recommendation and, therefore, prevent waste. The individual regulatory bodies in the oil-producing states are the only ones with power to limit production to consumptive demand. If they fail to measure up to their duties, privileges, and responsibilities, the present conservation program will fail, and national regulation of some sort will result."

He was strongly supported by Judge J. C. Hunter, of Abilene, Tex., president of the Mid-Continent Oil and Gas Association, who with the background of the recent Cole committee hearings at Washington, also predicted that the ball would be taken from the states and that federal control would be substituted unless the states' regulatory bodies demonstrated their ability to cope with the conditions now confronting them.

W. R. Boyd, Jr., executive vice president of the American Petroleum Institute, New York, stressed the significance of the current operating position of the industry, as revealed at the morning session in an analysis by Fred van Covern, head of the Institute's statistical department.

The plans of the Compact Commission in regard to these and other matters discussed today are summarized in the accompanying statement headed "Highlights at Oklahoma City."

Three Reports

Members of the commission and approximately 50 operators and representatives of trade associations heard three analyses covering statistical trends in the industry operations. The reports were given by A. G. White, chief petroleum economist of the Bureau of Mines, under whose direction the monthly forecasts of crude-oil requirements are prepared; Col. H. B. Fell, vice president of the I.P.A.A. and chairman of the association's committee on balance of supply with demand, and Mr. Van Covern, of the A.P.I.

The report of Mr. White, who appears regularly on the program of the compact commission, covered in considerable detail the operations of the industry since the first of the year. He explained that while the first-quarter domestic demand for crude oil had been larger than expected, due largely to the exceptionally large gain in consumption of heating oils, the decline in exports of several products had been greater than projected, so that the total requirements for all oils had been in line with predictions made at the start of the year.

He said that as of April 1 from 12 to 13 million barrels of crude oil and approximately 21 million barrels of gasoline had been added to inventories this year. He estimated that gasoline stocks were 15 million barrels higher than working requirements for this season of the year.

Other data that he presented showed an estimated increase of 12 per cent in demand for all oils the first quarter, with 16 per cent gain in domestic demand. The gain in demand for heating oils was approximately 30 per cent.

Mr. White said that gains for the remainder of this year would be less than during the first quarter. After analyzing the trend in first-quarter exports he predicted that total exports for the year would be down 20 to 25 million barrels compared with 1939. He said this decline was a reflection of credit and exchange conditions, restriction of civilian consumption, and the gains in production outside this country, notably Venezuela and Colombia.

He stressed the fact that another factor in the demand for domestic crude oil was the increase in imports, the gain amounting to approximately 5 million barrels the first quarter. This gain is partially a reflection of the trade agreement with Venezuela. Mr. White estimated that with the declining exports the increase in demand for all oils for the year would not exceed 5 per cent. In

estimating the domestic production to meet this demand, he explained that it was necessary to keep in mind that increased imports would absorb part of the enlarged market in this country.

In regard to the outlets for the several states, he pointed out that if Illinois produced an average of 400,000 bbl. daily this year, its 1940 production would be more than 46 million barrels greater than in 1939. This gain, he explained, would provide for a large part of the total increase in requirements this year, thus reducing to a minimum the share of other oil states in the greater market. He also stressed the fact that the excess gasoline now in storage would take care of part of the expected 5 per cent increase in motor-fuel shipments over the next 6 months.

Mr. White concluded from his analysis that the demand for domestic crude oil for the second quarter would not exceed 3,600,000 bbl. daily with a third-quarter demand of 3,700,000 bbl. daily.

I.P.A.A. Estimate

The report of the I.P.A.A. committee on balance of supply and demand, represented by Colonel Fell, was critical of the action of the state-allowables bodies of several states in permitting excessive production of approximately 200,000 bbl. daily for the last quarter of 1939. The report revealed excessive crude production in recent weeks, additions to crude-oil storage, gasoline stocks, excessive by 18 million barrels, and increased imports. Data were offered showing that in March domestic production due to the high allowables exceeded actual demand by 357,300 bbl. daily, or 10.2 per cent. The committee estimated that the demand for domestic crude oil in the second quarter would average 3,550,000 bbl. daily, of which 590,000 bbl. daily would be in California and 2,960,000 bbl. daily east of that state.

"The current trends in the production and refining, if not corrected," the report said, "may well result in the same unsound and inequitable conditions that led to the shutdowns in August of last year."

Heating-Oil Problem

The analysis of the heating-oil situation by Mr. Van Covern was of particular interest. He presented data showing that the exceptionally large increase in demand for products classed as distillate and gas oil and largely utilized as heating oils, had been a major factor in bringing about the unbalanced crude-oil production and refinery-output situation.

Mr. Van Covern said that part of the trouble was due to the fact that the increase in stocks of these oils at the start of the consuming season in the fall had not kept pace with the increase in demand, resulting in shortages which necessitated excessive plant operations. He pointed out that while gasoline demand has increased 45 per cent in the past 6 years the increase in gas-oil and distillate demand has been 115 per cent.

He analyzed other phases of the industry's operations and concluded:

"Domestic demand for motor fuel during 1940 probably will not be more than 5 to 6 per cent above 1939. The expected low level of export shipments will reduce the increase in total demand to about 3 per cent.

"Motor-fuel stocks are at their all-time peak and considerably above normal requirements.

"One of the contributing reasons for the currently large motor-fuel inventories is the fact that the industry entered the 1939-40 winter season with inventories of that product already high, but with insufficient light fuel oil in reserve.

"If an improved set of conditions is to prevail at the end of the 1940-41 winter, lower motor-fuel stocks are indicated at the end of the coming summer, when compared with last year, and higher light-fuel-oil inventories.

"Increased yields of light fuels are not only necessary but possible and entirely within the limits of flexibility of present facilities.

"It is not immediately apparent that the shifting of gasoline and light-fuel-oil yields within the necessary limits will affect octane requirements.

"This may not be the situation with respect to all refiners, but it would appear that in those districts in which this is an important problem reforming equipment and the other facilities necessary are generally available.

"If finished and unfinished gasoline stocks as of September 30 next are higher than in 1939, it will be a direct reflection of a continuation of current high levels of crude-oil production."

Proration Practices

The commission in appointing a committee on proration practices took its first definite step to bring about greater uniformity in the application of conservation principles among the several oil-producing states. The appointment of the committee was in line with the recommendation of the advisory committee on economics at the meeting of the commission in Santa Fe, N. M., July 19, 1939 (see The Oil and Gas Journal, July 27, 1939, p. 68).

The advisory committee was composed of an appointed committee consisting of Dr. Alexander Sachs, petroleum analyst, New York; Dr. E. De Golyer, producer and analyst, Dallas, Tex., and Dr. Joseph E. Pogue, vice president of Chase National Bank and petroleum economist. This committee, after a study, made definite recommendations as to the necessity of a better-correlated program of applying proration practices with the following general objectives:

"1. That each oil pool shall be limited in output to its optimum rate; that is, shall be produced in such a manner that the ultimate oil recovery will be the maximum consistent with economic limitations.

"2. That equity amongst competing interests be done by operating wells in such manner that cross drainage is minimized."

The committee recommended:

"(*a*) That the Interstate Oil Compact Commission appoint a committee on proration practices, composed as follows: From each compacting state, one member each from the regulatory body and the state geological survey; from each noncompacting state, one member each from the state geological survey and the state university; this committee to be headed by the chairman of the Interstate Oil Compact Commission and be charged with the duty of studying the existing proration practices in each state and reporting thereon.

"(*b*) That the Interstate Oil Compact Commission appoint a committee on standards, composed of prominent leading technicians, including engineers, economists, and experts on administrative law, to be selected by the chairman of the Interstate Oil Compact Commission with the aid of suggestions supplied by the American Petroleum Institute, the Independent Petroleum Association, the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, and the American Association of Petroleum Geologists. This committee to be headed by a chairman of its own selection, and charged with the duty of projecting and codifying the findings of the first committee and reporting thereon to the commission.

"The reports of these committees will be of far-reaching value in furthering the development and application of proration along sound and constructive lines. One of the prime needs in the oil business today is the establishment of adequate production standards, based upon engineering criteria, which will substitute well-formulated

(Continued on Page 26)

Highlights at Oklahoma City

Interstate Oil Compact Commission agreed that policy of some states in establishing allowables in excess of Bureau of Mines recommendation had been a mistake and adopted a resolution recommending that the oil-compacting states issue their orders for a 3-month period based on May recommendation of Bureau of Mines.

Commission adopted the recommendations made by the advisory committee on economics at the commission's meeting at Santa Fe, N. M., last July and appointed a committee on proration practices to report at next meeting; the chairman was authorized to appoint a committee on standards as recommended by the advisory committee.

P. J. Hoffmaster, compact representative from Michigan, was elected second vice chairman of the commission. Charles L. Orr was reelected secretary.

Representatives of the Bureau of Mines, Independent Petroleum Association of America, and American Petroleum Institute presented reports covering the present statistical position of the industry. The reports, which were in substantial agreement as to causes and cures for unwanted conditions, revealed:

That domestic crude-oil production in recent weeks, due to failure of states to follow Bureau of Mines recommendations as to demand, had been excessive by approximately 300,000 bbl. daily, resulting in approximately 10 million barrels of crude being added to storage during March.

Increased imports and decreased exports will affect demand for domestic crude oil over rest of year. Domestic crude-oil production for the second quarter should not exceed 3,600,000 bbl. daily, according to Bureau of Mines and 3,550,000 bbl. daily, according to I.P.A.A.

The present record gasoline stocks are in excess of seasonal requirements by 15 to 18 million barrels. This excess is approximately equal to the expected increase in motor-fuel demand for the second and third quarters over same period last year, and this fact should be taken into consideration in projecting crude-oil production and refinery operations over the next 6 months.

The expected increase in Illinois crude-oil production this year over 1939 of at least 46 million barrels will take care of a large part of expected gain in domestic crude-oil requirements.

The unbalanced crude-oil and refinery operations have been partly due to unexpectedly large increase in consumption of distillates and gas oils. This trend probably will continue and should be anticipated in storage programs and the greater use of refinery flexibility in yields of gasoline and these heavier oils.

The large percentage increase in demand for crude oil and most refinery products the first quarter will not continue over the rest of the year and 1940 operations should be based on an average increase of about 5 per cent.

Oklahoma City skyscrapers framed by oil derricks. Current drilling in the City field brings activity to the north and east edge of the business district and only a few blocks from the heart of the downtown district

Oklahoma City Field Enjoying Another Periodic Flurry

By DAL DALRYMPLE

THE Oklahoma City field, well into its twelfth year of production, is having one of its periodic flurries of drilling activity. Sixteen operations are listed in the current report, including 1 well just completed, 13 tests at various stages of drilling and 2 rigs. A month ago there were only seven operations, in addition to some old wells that were being reworked.

Not a great amount of activity if compared with some of the newer, busier flush fields of the day —but impressive, certainly, when it is remembered that 1,509 wells had been drilled at Oklahoma City up to January 1, 1940, and that the pool has produced nearly 500,000,000 bbl. of oil since it was discovered December 4, 1928.

Rotary derricks are arising almost within the shadows of skyscrapers in the downtown business district, only a few blocks distant from the most recently completed well. The new activity is along the west edge of the field, in the heart of a thickly populated section of the city, where the new derricks crowd close to schools, residences, apartment houses and outlying stores. The bulk of the work is centered in the Stiles Park area, in Section 34-12n-3w, and south of the State Capitol grounds in Section 27-12n-3w. A few tests are scattered in other sectors.

It has been predicted this may be the last flurry of new drilling at Oklahoma City, that the row of city blocks now being drilled along the west edge of the proven area will define the field in that direction. Some operators do not see eye to eye with the prophets, however. Willing to risk water encroachment, they possibly may extend operations to the next tier of blocks on the west, even to the very edge of the downtown business district if the necessary permits can be obtained.

The newest completed well is on the west edge, near the center of the current activity. While the initial potential does not loom large in comparison with those of some of the big wells drilled in the Capitol extension a few years back, it is big enough to encourage further exploration.

It is Phillips Petroleum Co.'s No. 1 Shirley, in approximately SE SE NW Section 34-12-3w. It flowed 997 bbl. of oil in the first 24 hours after shooting Wilcox sand at 6,495-6,543 ft., total depth. Sand was topped at 6,380 ft. Production declined slightly in the next 24 hours, when 929 bbl. of oil was tanked.

Several other tests are near completion. The current field report shows the following operations:

Phillips Petroleum Co.'s No. 8 Stiles, SW NW NE Section 34-12-3w, topped Simpson zone at 6,368 ft., set 7-in. pipe at 6,378 ft., total depth 6,380 ft., waiting.

Clark & Co.'s No. 1 Ancell, SE SW SE Section 34-12-3w, was being put on pump after shooting in Wilcox sand topped at 6,275 ft., total depth 6,495 ft.

Phillips Petroleum Co.'s No. 1 Ethel, SE NE NW Section 34, drilling below 3,855 ft.

Same company's No. 1 Holtz, SE NW Section 34, drilling below 3,535 ft.

British American Oil Co.'s No. 2 Military, NE NE SW Section 34, drilling below 2,673 ft.

Midcontinent Map Co., Tulsa

Current drilling activity in the Oklahoma City field largely is centered in Sections 27 and 34-12-3w, in a residential district between the State Capitol grounds and downtown business district. Phillips Petroleum Co.'s No. 1 Shirley, newest producer, was completed last week for 997 bbl. of oil

Phillips Petroleum Co.'s No. 1 Anderson, SE SE SW Section 34, rig.

Same company's No. 1 Mercer, NE NE NW Section 34, rigging up.

Champlin Refining Co.'s No. 1 Littlepage, SW NW NW Section 35-12-3w, had Wilcox sand at 6,288 ft., total depth 6,532 ft., set 8-in. pipe at 6,298 ft. and was shut down.

Phillips Petroleum Co.'s No. 1 Ellison, NE SE SW Section 27-12-3w, found Simpson zone at 6,460 ft., total depth 6,516 ft., cemented 7-in. casing at 6,509 ft., and was waiting.

Same company's No. 2 Ellison, NE NW SW Section 27, drilling below 3,552 ft.

Outpost on East Side

Zeb Drilling Co.'s No. 1 Highland, NW SW SE Section 26-12-3w, outpost on the east side of the field, had Simpson sands beginning at 6,227 ft., total depth 6,310 ft., and was shut down. Saturated sand was reported and it was looked upon as an east-extension well as far back as last November, but operators have not been able to complete as a producer.

U. S. Petroleum Co.'s No. 1 Shinopoulo, SW SW SW Section 15-12-3w, in dolomite zone, set pipe at 6,375 ft., total depth 6,449 ft., waiting.

Indian Territory Illuminating Oil Co.'s No. 12 Emerson, NW NE SW Section 30-11-2w, in the south part of the field, had lower Hoover zone at 4,055 ft., total depth 4,082 ft., and swabbed 109 bbl. of oil in 11 hours.

Same company's No. 3 Canfield, NE SE SW Section 24-11-3w, had Hoover at 4,039 ft., was shot at 4,052-68 ft., total depth, swabbed a small amount of oil and water, was put on pump and shut down.

Same company's No. 6 Wisel, NW SW SE Section 26-11-3w, drilling below 3,725 ft.

Two additional locations have been announced but were not included in the current report. One is J. F. Richardson's No. 1 Riley, NW SE SW Section 27-12-3w, in Lincoln Park addition. The other is Temple Thompson's No. 1 Cary, NW SE NW Section 34-12-3w, near the new Shirley producer. Mr. Thompson has been negotiating with Oklahoma City officials for a lease on city-owned Stiles Park.

Drilling on Parkway

Numerous difficulties, both legal and physical, have beset operators in starting some of these new tests. The No. 2 Ellison is characteristic. After a bitter fight the Oklahoma City Board of Adjustment granted Phillips Petroleum Co. and Kerlyn Oil Co. a joint permit to drill on a parkway "island" between Fifteenth and Sixteenth streets and in the center of Lincoln Boulevard, south of State Capitol property. A majority of property owners in restricted Classen's North Highland addition joined in a community lease to participate in the well and favored granting the permit. They argued that for years, unable to break plat restrictions on their undrilled addition, they had stood by without reward while their neighbors in unrestricted additions had been receiving oil royalties. The location is just south of parkways owned by the state in front of the capitol, and on which the state permitted drilling of wells without consideration of city ordinances. Counsel for the proponents pointed out the state wells have produced more than 1,000,000 bbl. of oil, and unless the permit was granted so they could get some of the oil quickly it would be too late. Other property owners vigorously opposed granting of the permit on the ground it would damage their property, and argued that plat restrictions on the addition extended to the "island," originally a part of the addition and ceded to the city for a parkway in 1921.

The operators' troubles did not end after the permit was granted. The parkway provided small space for operations. It was necessary to shift the location to the northwest corner of the miniature lease because a big storm sewer went through the center of the tract. Then, in order to get necessary material on the narrow strip, tanks were used for slush pits and part of the equipment was stacked in tiers.

Similar physical difficulties have delayed operations on some of the other locations. Fences have been torn down, garages removed and, in some instances, houses trimmed or moved to permit erection of derricks.

Lincoln Terrace addition, immediately east of the state wells on Lincoln Boulevard, and practically surrounded by producers, remains undrilled. Property owners have successfully opposed drilling in this exclusive residential district. Plat restrictions provide that no property within the addition can be used for nonresidential purposes, and since 100 per cent agreement of property owners could not be obtained, all proposed drilling operations for the area have been blocked. There have been numerous legal battles in both state and federal courts in attempts of operators to open the addition for drilling, but all attempts have failed, while rich wells along the border continue to drain the addition. Several plans for whipstock drilling locations adjoining the addition also have been blocked.

Total Production Soars

Production figures for this richest of Oklahoma oil fields show why operators are so anxious to drill on every promising and available location that they will fight in the highest courts of the land for the right.

Corporation Commission statistics show that a total of 475,640,053 bbl. of oil from all pay sands had been produced and accounted for up to January 1, 1940, according to W. J. Armstrong, chief conservation officer. That total included 343,894,914 bbl. from the Wilcox sand zone, alone. Another tabulation, which takes into account oil surreptitiously produced during the heydey of the boom and before proration became thoroughly enforced, shows a cumulative total of 357,932,000 bbl. produced from the Wilcox zone to the first of this year. Taking that total as the more accurate for Wilcox production, and using the commission's figures for the other pay horizons, the grand total for the entire field at the year end would have been 489,677,139 bbl. More than 9,000,000 bbl. additional has been produced since the first of the year, bringing the cumulative total to nearly half a billion barrels.

Total recovery by zones, number of wells producing from the several horizons, and other data, as compiled by the conservation department, are shown in Table 1.

TABLE 1—OKLAHOMA CITY FIELD

	Jan. 1, 1940
Total wells drilled	1,509
Total dry holes	34
Total wells plugged or shut down	557
Total producing gas wells	101
Total producing oil wells by horizons:	
Wilcox	530
Lower Simpson	198
Upper Simpson	23
Pawhuska	18
*Layton	3
*Oswego	4
*Detrital	2
Cleveland	19
*Hoover	37
*Lime	4
*Tonkawa	4
*Oolitic	3
*Prue	6
Total producing oil	851
Recovery January 1, 1940, by zones:	
Wilcox	343,894,914
Lower Simpson	106,245,759
Upper Simpson	2,080,304
Pawhuska	1,627,185
Cleveland	1,693,205
*Miscellaneous formations	20,098,686
Grand total	475,640,053

There are 22 pay horizons in the field, including 8 gas zones. Oil is found in Wilcox sand, lower and upper Simpson, Pawhuska, Layton, Oswego,

(Continued on Page 139)

Drillers have become accustomed to close quarters at Oklahoma City and those on this well, Phillips Petroleum Co.'s No. 1 Ellison, merely trimmed a garage and removed a porch from a residence in order to get room to erect their rig. This well is in a residential district between the Capitol and downtown business district

STATE CAPITALS...

OKLAHOMA

A HEARING ON ALLOWABLE PRODUCTION in Oklahoma in May will be given purchasers and producers of crude at Oklahoma City by the Oklahoma Corporation Commission on April 26, according to William J. Armstrong, chief conservation officer.

MICHIGAN

A REQUEST FOR A STATE RULING on natural-gas well spacing was among items considered in Lansing Monday, April 8, at a public hearing conducted by the Michigan Oil Advisory Board. Operators in the Wise pool of Isabella County suggested to F. R. Frye, state petroleum engineer, that wells be limited to one per 160 acres. Many of the state's gas wells are on that basis, but such action is purely voluntary. The board also heard operators' views on a proposal to change the oil-well spacing in the Wise field from the conventional one well to a 10-acre tract to a 20-acre diagonal arrangement.

The state Tax Commission announced February oil and gas severance-tax collections totaled $41,207, compared with $45,421 in January. The decline was the result of a 170,000-bbl. decrease in oil production to 1,870,499 bbl., and a decrease in natural-gas production from 1,590,301,985 to 1,347,417,899 cu. ft.

CALIFORNIA

DECREASES IN STORAGE of California oil for the second consecutive week have reduced total additions from January 1 to March 23, 1940, to only about 445,000 bbl., according to preliminary estimates of the Oil Producers Agency. This slight increase in 1940 is in sharp contrast with the accumulation of 4,065,000 bbl. during the same period last year. The decrease during the 2 weeks ended March 23 was 1,514,000 bbl., noteworthy because it not only put an end to a 6-week period of additions to stocks but also because decreases in storage at this season of the year run counter to the normal seasonal trend. Last year drafts on storage did not start until the middle of April. The whole production and storage picture of the California oil industry has been out of the ordinary during the past several months. Oil did not start running into storage this season until December 1939.

TEXAS

A STATE-WIDE HEARING on allowable crude-oil production in Texas will be held in Austin on April 18 by the Railroad Commission of Texas.

Texas won't be ready for a 90-day oil-proration order before the first of June, Railroad Commissioner Jerry Sadler said.

Mr. Sadler was commenting on action of the Interstate Oil Compact Commission which at its meeting in Oklahoma City on April 5 went on record for 90-day orders. The movement was launched by Texas Commissioner Ernest O. Thompson, who said he spoke for himself and Railroad Commission Chairman Lon A. Smith, of Texas, and advocated the order to "take proration out of politics, at least in Texas."

Mr. Sadler said the reason he was not for a 90-day order until June was that the commission's engineering staff is now making a state-wide survey of wells unable to make their allowables. This survey, he said, likely will show 60,000 bbl. of allowable oil assigned to wells not able to make their allowables.

This condition prevails, he said, in about 15 fields, but he declined to name the fields except to instance K.M.A., Wichita and Archer County, upon which a hearing has been called for April 15 at the request of operators themselves.

It will take the rest of April and May to complete the survey, he said; then Texas will be ready for a 90-day order through June, July, and August.

AN APPEAL TO THE U. S. SUPREME COURT was taken on April 8 of a case involving the validity of a Texas Railroad Commission permit issued to W. D. Ambrose to drill eight wells in the East Texas oil field.

Offsetting landowners filed suit in federal District Court to enjoin the drilling of the wells, and sitting alone in Austin, District Judge R. J. McMillan issued the injunction.

Atty. Gen. Gerald Mann planned to ask the U. S. Supreme Court for a writ of mandamus to compel Judge McMillan to vacate his injunction, on the ground that a three-judge court was necessary before an order of a state administrative agency could be enjoined.

F. V. L. PATTEN, director of production for the Texas Railroad Commission, received the degree of bachelor of science in chemical engineering from the University of Texas in 1931, remaining at the university 4 years more to do graduate work, receiving the degree of master of science in 1932 and doctor of philosophy degree in 1935. In June 1935 he took a position as chemical engineer for the Railroad Commission of Texas. In September 1936 he resigned to serve as associate professor of natural gas engineering at Texas College of Arts and Industries, but in June 1937 resumed work with the Railroad Commission, as research engineer. As a result of the investigation he conducted on condensate wells, the commission promulgated an order in January 1939 classifying the condensate wells in Texas as gas wells and began regulating them as such. The regulation of these wells in this manner has been perhaps responsible for the recycling industry in Texas. At the present time over 400,000,000 cu. ft. of gas is being processed through recycling plants in Texas each day, with prospects of a very substantial increase in the volume of gas recycled during 1940. Dr. Patten continued as research engineer until promoted to his present position as director of production in May 1939. The work of this position embodies all the engineering work conducted by the Oil and Gas Division of the Railroad Commission. Engineering activities are under his supervision

ILLINOIS

LEGISLATION AFFECTING THE ILLINOIS oil industry will not be considered at a special session of the general assembly called for April 30 by Governor Horner.

Although a measure proposing a severance tax on oil produced in the basin fields was tentatively slated for consideration in the extraordinary session, the executive confined the call to 12 subjects dealing primarily with relief, old age assistance and other emergency matters.

He said "it is a foregone conclusion that the general assembly cannot reach an agreement in the matter of oil regulation" at this time.

Leaders of both major political parties are now firmly convinced the broader subject of control or proration legislation will not be considered until the assembly convenes in regular session in January 1941.

Prior to that time, however, it is readily admitted administration leaders will probably hold hearings on proposed measures in order to determine the attitude of the industry toward control legislation.

Possibility of the introduction of oil-tax legislation is not precluded, although it was not specifically mentioned. Aides of Governor Horner later admitted that funds may be raised for old-age assistance increases, and that a clause inserted in the first point in the call permits the injection of revenue-raising legislation.

LT. GOV. JOHN STELLE proclaimed himself "acting governor" Monday but ailing Gov. Henry Horner refused to relinquish his office.

Lieutenant Governor Stelle, insurgent candidate for the Democratic nomination for governor, strode into the governor's state-house office, seated himself at a secretary's desk and issued the proclamation. He signed himself "acting governor" and called the legislature into special session April 30—the same date listed in a similar call by Governor Horner filed less than an hour earlier.

Mr. Stelle told reporters he was assuming the governor's duties under the disability clause of the state constitution. He contended Mr. Horner had been ill 18 months and that his power had been "usurped" by state Finance Director Samuel L. Nudelman and other "back-room bosses."

While Mr. Stelle prepared to leave for Chicago, Atty. Gen. John E. Cassidy termed Mr. Stelle's action "absolutely null and void."

Mr. Horner, confined to the executive mansion by illness, said: "I will continue to serve as governor" and declared Mr. Stelle's "pathetic antics" should evoke "pity rather than censure." He described Mr. Stelle as a "desperate and defeated man."

ARKANSAS

The Arkansas Oil and Gas Commission made no change in allowable production of crude oil in April. It is 70,000 bbl. per day, or 5,500 bbl. per day in excess of the estimate of demand made by the U. S. Bureau of Mines.

KANSAS

ALLOWABLE PRODUCTION IN APRIL in Kansas was placed at 151,000 bbl. per day by the Kansas Corporation Commission, thus conforming to the U. S. Bureau of Mines estimate of demand.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

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Fulfilling the Compact

The Interstate Oil Compact Commission at its Oklahoma City meeting took one of the most important steps in its history when it approved a recommendation which seeks to bring about greater uniformity among the states in applying conservation regulations.

The only conspicuous weakness in the plan of state regulation has been a lack of coordination in the matter of practices among the principal oil-producing states.

The commission has now appointed a committee on proration practices which will conduct a nation-wide study covering conditions in each state. Later a committee on standards, composed of technological, economic, and legal experts, will codify the recommendations of the committee on practices and report its conclusions to the compact commission.

As was pointed out by the advisory committee at the Santa Fe meeting of the commission last July, "One of the prime needs in the oil business today is the establishment of adequate production standards, based upon engineering criteria which will substitute well-informed principles for the uncertainties which in the past have inevitably brought pressure upon the regulatory bodies for exceptions and divergencies."

One of the objections offered to the compact commission serving as a clearing-house for developments in the industry bearing directly on conservation practices is that the commission has no authority to enforce its recommendations. Therein, however, lies the real strength of the compact in these matters.

It is doubtful if any federal commission could promulgate rules and regulations rapidly enough to cover the conservation problems, which each situation develops in the industry under widely varying conditions. The tendency under such a form of control would be for the operators to keep close to the letter of the law.

The advantage of the compact lies in the fact that it can ask and obtain the cooperation of the states and operators in the application of the general rules which are to be observed.

Most of what has been done in the matter of conservation has been accomplished through the voluntary action of the great majority of the operators. With rare exceptions, operating companies are now conservation-minded, and, without compulsion from any agency, see to it that their operations are conducted without waste.

A major handicap in this development has been lack of uniform regulations among the states as to what constitutes waste and the proper bases for the application of proration practices.

The danger is that through this divergence one state becomes more attractive than others to operators due to the manner of applying its conservation program.

Such a condition, if continued over a long period, must eventually nullify any type of conservation and destroy all that has been accomplished.

The compact commission was created to supplement the work of the state conservation bodies and to bring about standard practices in drilling and the operation of producing properties. It has now set in motion the machinery which will achieve that purpose.

It is the answer to one speaker at Oklahoma City who said: "As a strong believer in states' rights and our present division of powers as defined by our constitution and as a strong believer in the desirability and ability of the oil industry and the Interstate Oil Compact Commission and the regulatory bodies of the oil-producing states to meet and solve the pressing problems before the industry, I grow somewhat impatient when I realize that we are not doing those things necessary to put our own house in order."

Refiners of Middle West Adopting A. S. T. M. Method of Testing

REFINERS generally throughout the Middle West will adopt the A.S.T.M. method of testing the anti-knock quality of gasoline a survey this week indicated. Following the action of the Western Petroleum Refiners Association in Wichita, Kans., last week in recommending employment of that method and abandonment of the L-3 method, the Mid-Continent Petroleum Corp. promptly announced its adoption of the A.S.T.M. The Cushing Refining & Gasoline Co. and Bell Oil & Gas Co. made similar announcements. Other refiners were about to pursue the same course.

Inquiry failed to reveal a single instance of opposition to the W.P.R.A.'s recommendation. There had been a question in the minds of refiners as to the attitude of the Socony-Vacuum Oil Co., Inc., but that organization's representative at the W.P.R.A. meeting voted in favor of the A.S.T.M. recommendations, and it was assumed that its western division would adopt that method of octane-number determination.

"Our so-called house-brand gasoline," says the Mid-Continent Petroleum Corp.'s announcement, "will be sold on an A.S.T.M. octane rating of 72-74; our leaded competitive grade of gasoline will be sold on an A.S.T.M. octane rating of 63-66; and our unleaded competitive grade of gasoline will be sold on an A.S.T.M. octane rating of 60 and below.

"Due to the fact that this new method of determining the octane qualities involves a substantial improvement in the house-brand grade, particularly, and that this improvement entails considerable increase in manufacturing cost, we are advancing our prices accordingly and for your information our new prices on the various grades are as follows: Ethyl, 6½ cents; house brand (72-74 A.S.T.M. octane), 5¼ cents; U. S. Motor (63-66 A.S.T.M. octane), 4¾ cents; U. S. Motor (60 and below A.S.T.M. octane), 4¼ cents. All prices are f.o.b. Tulsa, Okla."

All refiners, in discussing their intention of adopting the A.S.T.M. method, said it would be necessary to advance their tank-car gasoline prices. The increased cost of production, it was said, would be ¼ to ⅜ cent a gallon. With general adoption of the A.S.T.M. method in the Middle West, refiners said, there was strong reason for believing the movement would spread and in a short time become national.

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Oklahoma Discovery Flows 305 Bbl. in 2 Hours

Classed as the most important discovery in Oklahoma since the Fitts field was opened, Pure Oil Co.'s No. 1 Quinton Little A, C W½ NE SE Section 28-5s-7e, wildcat east of Madill in Marshall County, flowed 150 bbl. of oil the first hour and 155 bbl. the second hour when opened for a test of the Tulip Creek sand horizon Tuesday, April 9. Gas gaged 2,500,000 cu. ft. Operators were letting the well flow but were preparing to wash the walls before completing. Hole was drilled to 5,640 ft. in McLish zone, plugged back to 5,100 ft. and casing set at 4,857 ft. for the test. It had shown as a commercial producer on drill-stem tests in both upper and lower Tulip Creek sands, but operators elected to drill to deeper horizons before testing. Location is on a 22,000-acre block, in an area that will be flooded when the Denison dam on the Red River is completed.

American Liberty Contract For Grapeland Plant

FORT WORTH, Tex.—American Liberty Oil Co. has let contract to Fowzer Construction Co., of Houston, to increase the capacity of its recycling plant in the Grapeland district from 20,000,000 to 40,000,000 cu. ft. daily. The additional capacity is to take care of three new wells recently completed. It is estimated the project will mean an additional outlay of $100,000.

Ark-La-Tex Division of W.P.R.A. at Shreveport

A program of unusual interest has been arranged for the monthly technical meeting of the Ark-La-Tex division of Western Petroleum Refiners Association, to be held on Friday, April 12, at the Washington-Youree Hotel, in Shreveport, La., at 4 p.m.

The meeting will be featured by a talk entitled, "Newer Uses of the Petroleum Olefines," by Dr. C. D. Lowry, Jr., of Universal Oil Products Co., Chicago, which will summarize the new contributions to the chemistry of these hydrocarbons which have been made by the petroleum industry, discussing the newer developments in petroleum technology which have grown out of this chemistry and the significance of these developments to petroleum refiners.

From the advanced study of the olefine hydrocarbons has come in recent years the revolutionary changes in petroleum refining, and the avenue to future possibilities is, in the opinion of many, only now really opening. Having made an extensive study of these developments, particularly from a chemical angle, Dr. Lowry is well qualified to discuss this important problem. His talk will be illustrated by lantern slides, and the usual open forum discussion will follow.

Dr. C. D. Lowry was educated at Northwestern, Harvard, and the University of Munich, Germany. For three years he taught chemistry at Stanford University in California, was for a time engaged in research for the Institute of American Meat Packers in Chicago, and since 1927 has been in the employ of Universal Oil Products Co. His work in connection with gasoline inhibitors has been noteworthy. Among Ark-La-Tex refiners he is well known, having been a frequent visitor in that territory.

DEATHS

FORESTER BURTON MOORE, 33, Tulsa, of the production department of Shell Oil Co., Inc., died April 7.

W. F. BESSELMAN, general superintendent of the General American Tank Storage Terminals, Chicago, died recently.

WILLIAM MARSHALL MITCHELL, 40, president of the Mitchell Drilling Co., of Great Bend, Kans., was killed April 6 when his car ran into a heavy culvert railing. He moved to Great Bend from Oklahoma City about 3 years ago and had drilled about 60 wells in the Great Bend area. He also formerly lived in Lubbock, Tex.

FRANK W. KING, 57, Tulsa, oil contractor and producer in Oklahoma and Texas, died April 7 in Mineral Wells, Tex., following a heart attack. He moved to Oklahoma from Pennsylvania about 25 years ago, settling first at Okmulgee and then in Tulsa. He was a brother of Joe T. King, Effingham, Ill., formerly of Okmulgee, head of the Kingwood Oil Co. and M. J. King.

FELIX QUINLAN, 88, independent oil producer, Tulsa, died April 3. A native of St. Albans, Vt., he spent his boyhood in Elicottville, N. Y., and entered the oil business in McKean County, Pennsylvania, in 1879, removing to Tulsa in 1919. Surviving are the widow, Katherine L. Quinlan; four sons, Charles P. and Harry F. Quinlan of Tulsa, Felix Quinlan of Beggs and Walter J. Quinlan of Stroud, and two daughters.

WALTER F. KEENAN, JR., 54, director and vice president in charge of engineering of Foster Wheeler Corp., New York, died recently. He was president of the American Boiler Manufacturers Association for the past 2 years. Graduating from the University of Pennsylvania in 1908, he joined Power Specialty Co. in 1911, and rose to the position of chief engineer. When Foster Wheeler Corp. was formed in 1927, he remained in charge of the steam engineering department and subsequently was elected a director and vice president in charge of engineering.

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Bureau of Mines Reports 144-Day Supply of All Oils

WASHINGTON, D. C., Apr. 8.—The Bureau of Mines reports the total supply of all oils at the end of February was 533,046,000 bbl., or a 144-day supply, compared with 520,446,000 bbl. in January and 564,928,000 bbl. in February 1939.

Motor fuel stocks, including aviation gasoline, amounted to 92,721,000 bbl. of finished gasoline compared with 79,691,000 bbl. in February a year ago.

Domestic demand for motor fuel in February was 37,557,000 bbl. compared with 40,370,000 bbl. in January and 34,595,000 bbl. in February of 1939.

THE MARKETS*

CRUDE OIL: A 1-day shutdown caused Texas crude-oil output to decline 116,358 bbl. a day last week, which more than accounted for the decline in total United States production of 100,549 bbl. a day, bringing the total production in the nation down to 3,754,738 bbl. a day.

REFINERY: Gasoline remains weak. Further softening of the market feared in Gulf Coast area and price wars developing in others. Slightly improved tone reported in some districts. Tractor fuels and kerosene in brisk demand. Natural-gasoline market demoralized. Lubricants soft in East, but steady in interior. Furnace oils still steady in East, but drifting lower at interior points.

TANK-WAGON AND POSTED DEALER: Prices of gasoline reduced at scattered points, including cuts of 1½ cents in Cheyenne, Wyo., by Continental and Macon, Ga., by Standard of Kentucky. The latter company advanced kerosene 1 cent in Atlanta, Ga.

FINANCIAL: The oils moved forward with the rest of the market and closed as a group at the highest figure touched since early January. Gains included Amerada 3¼ points and Skelly 2½ points. Average of 30 representative stocks for week ended April 6: High, 27.21; low, 25.96; close, 26.93. Week ended March 30: High, 26.33; low, 25.45; close, 26.09.

*Detailed information in market section.

OIL COMPANY REPORTS

	Year	Net income	Earned per common share
Washington Oil Co.	1939	$32,173	$1.36
	1938	5,150	0.22
Saltmount Oil Co.	1939	209,735	1.11
	1938	226,415	1.19
Southland Royalty Co.	1939	274,305	0.32
	1938	429,008	0.50
Republic Petroleum Co.	1939	119,642	0.29
	1938	110,842	0.26
North Star Oil, Ltd.	1939	78,365	0.04
	1938	117,256	0.24
Gilmore Oil Co.	1939	839,193	2.96
	1938	937,723	3.30
National Refining Co.	1939	68,887	*0.67
	1938	*529,749	*2.01
Savoy Oil Co.	1939	*4,163	*0.03
	1938	1,186	0.01
Universal Consolidated	1939	513,313	2.57
	1938	350,657	1.75
Red Bank Oil Co.	1939	*167,635	*0.71
	1938	*218,765	*0.92
Crown Central Pet.	1939	136,314	0.16
	1938	*586,257	*0.72
Indian Refining Corp.	1939	1,610,633	1.27
	1938	*379,828	*0.30
Standard Oil of Calif.	1939	17,822,505	1.36
	1938	28,875,653	2.22
Consolidated Oil Corp.	1939	7,540,881	0.55
	1938	7,737,712	0.54
Total 65 companies reporting	†1939	$200,056,060	
	1938	180,530,792	

*Deficit. †Including companies previously reported.

International

Mexico . .

U. S. State Department Demands Arbitration

ARBITRATION of Mexico's expropriation of American-owned oil properties is formally proposed in a note delivered to the Mexican ambassador by Secretary of State Cordell Hull.

The text was not made public, and State Department officials declined to say more than to admit it proposes arbitration through an international committee.

The note is regarded as indicating a stiffening of the State Department's attitude toward the Mexican Government. Formal request for arbitration was not unexpected, even though President Cardenas some time ago rejected an informal suggestion for arbitration. The Mexican Government has held that since the American-owned oil companies were incorporated in Mexico there is no matter for international arbitration and the controversy is one for domestic negotiation between the government and the companies. The State Department refrained from taking vigorous steps while the constitutionality of the expropriation was under consideration by the Mexican courts, which 4 months ago upheld the expropriation decree.

The Mexican Federal Arbitration Board ruled Monday that foreign oil companies whose properties were expropriated must pay the Mexican Petroleum Syndicate 117,500,000 pesos ($19,583,330) indemnity for violation of a labor contract on March 17, 1938, the day before expropriation.

Venezuela . .

Miniature Oil Industry At Caracas Exhibition

THE most recent manifestation of willingness on the part of international oil companies to cooperate with the governments of foreign countries in which they operate is the construction of a complete miniature operation for addition to the Venezuelan Exhibition of National Industry and Raw Materials at Caracas.

Miniatures are no longer novel in the petroleum-equipment industry, but that built at Long Island City, N. Y., for the combined account of Standard Oil Co. of Venezuela, Lago Oil & Transport Co., the Shell group of subsidiaries and Mene Grande Oil Co. probably represents a new standard for complete visual presentation in the production, transportation, and refining of oil.

Built of steel, aluminum, brass, glass, and wood, the model is one-twentieth life size and will occupy a table 24 ft. long and 16 ft. wide. Assembled, the table top, or surface of the earth it represents, will support four oil derricks, one in each corner, and a still, bubble tower, and storage tanks in the center. Each unit is completely equipped with its usual accessories, and the whole model is so laid out and constructed that those viewing it will be able to follow the course of the crude oil from the time it is brought to the surface until it enters the storage tanks as gasoline, gas oil, lubricating oil, and fuel oil.

Sunk into the table beneath each of the oil wells is an illuminated reproduction of the substrata of a producing oil field in Venezuela. Spectators can see just where the oil in each field lies and how the wells are drilled.

Each derrick and rig is different. One, which stands more than 6 ft. high, is a drilling rig, complete from the gin pole at the top to the blowout preventer in the cellar beneath the derrick floor. Twin steam boilers stand nearby to supply power to the draw works, but a hidden electric motor actually drives the rig. The traveling block really travels, pulling or setting drill pipe and casing; the rotary table revolves just as it would on a standard rig and beneath the "earth's surface" the churning bit nears the "oil sand."

In another corner of the table, or "lease," a shorter derrick, not quite 5 ft. tall, stands over a flowing oil well. Beneath its steel skeleton a christmas tree directs the flow of oil into a separator and then to the refinery.

The derrick on the third corner of the table marks a pumping operation with its engine-powered counterbalance motivating the walking beam and rods through the tubing.

The fourth derrick rises over a reconditioning job. It is so arranged that various operations can be depicted such as replacing damaged joints of casing, cleaning out, or pulling rods, tubing and working barrel.

Slender glass pipe lines connect each well with the refinery that stands in the center of the lease.

Cuba . .

Atlantic Refining Co. to Drill Five Test Wells

THE Atlantic Refining Co. has awarded to the Pioneer Drilling Co. a contract for drilling five test wells on its Cuban properties. The award of the contract follows an intensive geophysical survey of potential oil-producing areas on the island which Atlantic has been conducting for several years. Drilling operations will start within the next 30 days.

Officials of Atlantic Refining Co. now have under consideration the advisability of effecting certain joint-interest arrangements with other American oil companies, under which its test-drilling program might be considerably expanded.

Atlantic has recently acquired two groups of titled concessions—one from the Cuban Oils Co. and one from the Havana Oil Co.—which it has added to its original properties consisting of several hundred thousand acres of titled concessions in Pinar del Rio, Havana, Matanzas, Santa Clara and Camaguey provinces. The five test wells definitely scheduled will be drilled on selected locations on its holdings.

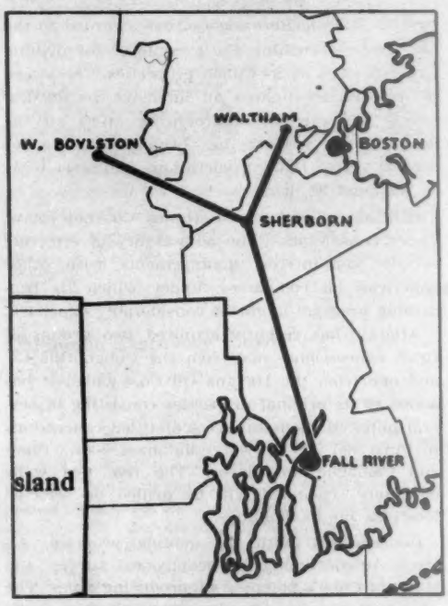
Concurrently with the drilling program, Atlantic is continuing its geophysical survey and study of Cuba's potential oil-producing areas. The company now has two seismograph crews and one gravimeter party in the field.

Model refinery unit, showing lease and refinery storage tanks, furnace and still, fractionating tower, condensers, heat exchangers, pump house with rundown tanks on top, and production storage tanks. Reconditioning well in background. Part of petroleum exhibit at Venezuelan Exhibition of Natural Industry and Raw Materials at Caracas

Pipe-Line Activity

Shell Will Construct 85-Mile Pipe Line in Massachusetts

Shell Pipe Line Co. will build an 85-mile 6-in. gasoline pipe line to serve the marketing area of eastern Massachusetts. The line is to run from a marine terminal at Fall River, Mass., to a terminal at Sherborn, a distance



Route of Shell Pipe Line Co.'s projected gasoline line in eastern Massachusetts

of 40 miles, where it will branch in the form of a "Y," one arm of which will go to a terminal at West Boylston in the vicinity of Worcester, while the other will go to a terminal at Waltham in the environs of Boston. The line is to be coated with asphalt and wrapped with paper only in places where soil surveys indicate that protection is necessary. A pumping station is to be located at Fall River, where it will connect with the Shell oil-products tank farm. A full line of products is to be handled, including gasoline, kerosene, and fuel oil. These products will be shipped to Fall River by tanker from the company's refineries at Houston, Tex., and Norco, La. The line will have a capacity of 10,000 bbl. per day; the company plans to handle products at the rate of approximately 7,500 bbl. per day.

By making shipments by this pipe line into eastern Massachusetts, deliveries can be made to the numerous towns and cities in this area by means of large tank-wagon equipment which is economical to operate. Objections have been raised to the use of this heavy equipment for moving products from a marine terminal in such a congested area as that of Boston and vicinity. Deliveries in the Boston metropolitan area are to be made with smaller trucking equipment.

Specifications have been issued to pipe-line contractors; bids will be received at noon, April 18, and contracts will be let soon afterward. Work will start between May 1 and May 15 and will be completed in 90 days.

T. R. Jones Will Commence Michigan Gas Job in May

T. R. Jones, Dallas, Tex., who was awarded the contract by Michigan Gas Transmission Co. for laying 53 miles of 24-in. pipe between Montezuma and Crawfordville, Ind., will commence the construction work on this project May 15. One gang will be used. The contract calls for the completion of the line on September 15. At present, T. R. Jones is building loops for Panhandle Eastern Pipe Line Co. in connection with the program of this company for expanding facilities for supplying gas from the Texas Panhandle and the Hugoton gas field to northern cities.

Georgia State Highway Board "Gives Up" Pipe-Line Case

ATLANTA, Ga.—Declaring that members of the state Highway Board were "in water, legally speaking, over their heads," Commissioner L. L. Patten last Thursday adjourned the pipe-line hearing until litigation pending in the Supreme and Superior courts has been settled.

The 4-day hearing came to a close after 1 day's testimony by Southeastern Pipe Line Co. which is seeking permission for gasoline lines to go under state highways, and 3 days' testimony by the railroads which are opposing the line.

The line, now under construction, will go from Port St. Joe, Fla., through Georgia to the Tennessee line near Chattanooga.

Commissioner Patten asked the attorneys on each side if they could not get together on some single question for the board to pass upon, pointing out that the board was not qualified to settle the question of unemployment, that taxes were a problem for the General Assembly, and that railroad economics should be settled by railroad executives. The chief arguments brought out in the 3 days' testimony by witnesses for the railroads had been in regard to these matters.

A. Steve Clay, president and attorney for the pipe-line company, pointed out that a ruling by Atty. Gen. Ellis Arnall empowered the board to grant or deny permission to lay pipe lines under highways and that the only question raised was the one regarding hazard to public health or safety. Adie Durden, representing the railroads, declared the Highway Board did not have the power to give this permission. This question is now in Superior Court Judge W. W. Mundy's court where the opponents of the line have filed an injunction against the board.

Atty. Gen. Ellis Arnall, representing the state, declared that the injunction suit, filed by Solicitor General Hal Hutchins, should be withdrawn since Mr. Hutchins, who is a state employe, filed it against the Highway Board, also acting in behalf of the state, and that a party cannot sue itself.

Whether the pipe-line company has the right to condemn property for right-of-way, as was set out in an act of the 1937 legislature, is the issue before the Supreme Court. Judge B. C. Gardner, of the Albany circuit, has ruled that the company does not have the power of eminent domain.

In answering the charge by Mr. Durden that the Highway Board did not have the power to act in granting permits, Mr. Clay said the pipe-line company was aware of the fact that a definite ruling could not be made by the board until after Judge Mundy's decision and asked him why, if the railroad representatives were so sure of their legal position on the matter, they had been conducting something closely akin to a "legislative filibuster" for the purpose of delay.

Saskatoon Franchise Is Voted To Franco Oils Company

CALGARY, Alta.—The voters of Saskatoon have approved granting a gas franchise to Franco Oils, subsidiary, Northern Natural Gas Co. The project was reported to contemplate construction of a 162-mile line from the Lloydminster field to Saskatoon, with distributing systems in Saskatoon, North Battleford and other communities.

Natural-Gas News

Gas Industry Reports Increase in Revenue

Revenues of manufactured and natural-gas utilities amounted to $92,847,300 in January, compared with $83,450,100 for January 1939, an increase of 11.3 per cent, it was announced by Paul Ryan, chief statistician of the American Gas Association. Revenues from industrial and commercial users rose from $24,298,800 a year ago to $27,787,500, a gain of 14.4 per cent. Revenues from domestic users such as cooking, water heating and refrigeration, etc., rose from $59,151,300 in 1939 to $65,059,800 in 1940, an increase of 10 per cent.

The natural-gas utilities reported revenues of $56,879,400 for the month, or 14 per cent more than for December 1939. Revenues from sales of natural gas for industrial purposes gained 16.4 per cent, while revenues from sales for commercial uses increased 16.2 per cent. Revenues from sales for domestic purposes increased 12.8 per cent.

The manufactured-gas industry reported revenues of $35,967,900 for the month, an increase of 7.2 per cent over January 1939. Revenues for industrial purposes increased 15.1 per cent while commercial revenues increased 6.6 per cent. Revenues from domestic uses were 2.1 per cent more while revenues for house-heating purposes gained 26.4 per cent.

Hope Natural Gas Seeks Adjournment In Rate Investigation

CLARKSBURG, W. Va.—Hope Natural Gas Co. has asked for an adjournment of the Federal Power Commission's rate investigation because it had not had sufficient time to prepare all needed exhibits. Examiner Edward B. Marsh granted a continuance until June 3.

Sixty-Million-Cubic-Foot Gas Well Blows Out Near Wellsville

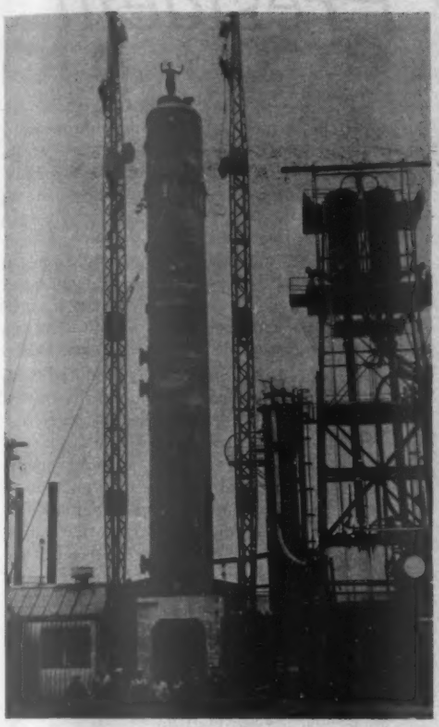
WELLSVILLE, N. Y.—An Oriskany sand gas well, with an open flow unofficially estimated as high as 60,000,000 cu. ft. per day, is blowing wild in Independence Township, Allegany County. The wildcat got the Oriskany unexpectedly at 4,915 ft. and blew itself in. It was drilled by Empire Gas & Fuel Co. of Wellsville and is the first Oriskany sand wildcat of the year to find new production in the northern Oriskany areas. It is on the Sam Crandall farm in northern Independence Township, about 1 mile north of two dry holes drilled to this sand some time ago. The nearest Oriskany gas field is the Beech Hill field in Willing Township, Allegany County, 6 to 7 miles southwest of the Empire well.

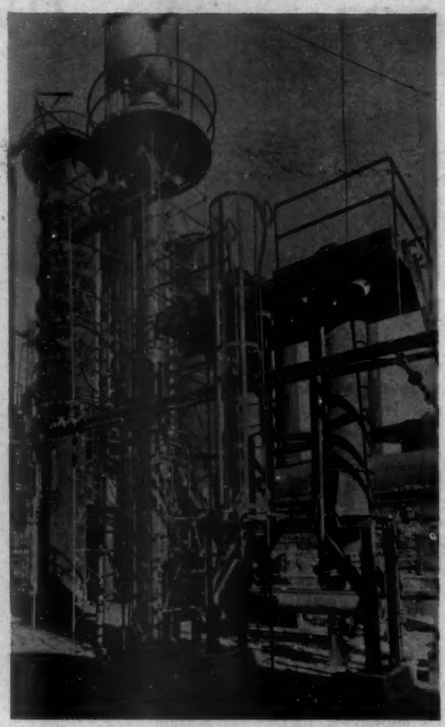
The well got the Tully limestone at 4,248 ft. but drillers failed to recognize the Onondaga lime, which immediately overlies the Oriskany. This accounts for drilling into the Oriskany unexpectedly. Normally casing is run and a control head installed before drilling into the sand.

Workmen were rushing preparations to kill the well temporarily. This may take several days. It was reported there was a small showing of salt water in the form of a fine spray. George Holbrook, general manager of Empire, said it is impossible to tell whether or not the water will damage or ruin the well.

The Crandall farm is about 10 miles southeast of Wellsville on the Andover-Whitesville road.

Refinery Expansion





Derby Oil Co. Nears Completion of Refinery Modernization Program

Within the month the Derby Oil Co. will complete its present refinery modernization program at its Wichita, Kans., plant. By May 1 the company expects to have in full operation its new U.O.P. catalytic polymerization unit, Perco treating plant, Hoover treating unit and the new 62-ft. by 7½-ft. stainless-steel-lined fractionating tower which will serve the cracking plant.

In this program of modernization Derby has prepared to make an increased yield of high-octane motor fuels and tractor distillates.

The polymerization unit is capable of handling up to 1,500 M.c.f. of cracked gases daily. Production is coming from the unit at present and final construction work simply involves minor adjustments in the operation and the insulation of parts of the equipment.

Gulf Oil Planning $5,000,000 Addition in Philadelphia

PHILADELPHIA, Pa.—Gulf Oil Corp. is planning an addition to its refining facilities here, it was reported yesterday. Although the cost was not made public it is estimated it will be around $5,000,000. The expansion it is stated, is needed to handle the increase in export business. With the completion of this new unit it is believed Gulf will enter its European shipments at this plant.

The company recently purchased 29½ acres at a reported cost of $150,000 from Atlantic Refining Co., increasing its total holdings to 330 acres.

Standard Supplies Aviation Gasoline for Record Order

All aviation gasoline supplied in the Middle West for what United Air Lines announces as the largest single contract ever signed by an air line for gasoline will be produced by Standard Oil Co. of Indiana in 1940.

To 11 airports in Colorado, Illinois, Iowa, Nebraska, and Wyoming, Standard of Indiana will supply 4,500,000 gal. of aviation gasoline from its refineries at Whiting, Ind., and Casper, Wyo.

The total national contract of 11,000,000 gal. of gasoline, which will weigh 33,000 tons, will fuel United's 57 mainliners for 20,000,000 plane-miles. On an overnight flight from California or the Pacific Northwest to New York a 12-ton mainliner burns 1,300 gal.

Rothschild to Install Cracking and Catalytic Polymerization Units

CHICAGO.—Harry S. Rothschild, president of Rothschild Oil Co., Santa Fe Springs, Calif., has just signed a license agreement with Universal Oil Products Co. for a Dubbs cracking unit and a U.O.P. catalytic polymerization unit. They are to be installed in the present Rothschild refinery, a skimming plant, and construction is to start at once. The Rothschild refinery is now running 3,000 bbl. per day of Signal Hill and West Montebello crudes.

The cracking and polymerization units are to be designed by Universal engineers and built by Fluor Corp. The cracking unit is to be of two-coil design with rated capacity of 2,200 bbl. of mixed charging stock, consisting of reduced crude and kerosene distillate from Signal Hill and West Montebello crudes.

The poly plant will be of size B, designed to produce polymer gasoline of 82-84 rating from 500,000 cu. ft. of cracked gas per day.

The Rothschild Oil Co. is the sixth independent California company to install Dubbs cracking. The others are Wilshire Oil Co., Mohawk Petroleum Corp., Eagle Oil & Refining Co., Fletcher Oil Co., Inc., and El Tejon Oil & Refining Co.

Ethyl Opens New Fuel-Testing Station at Yonkers

A modern fuel-testing laboratory has just been completed for the Ethyl Gasoline Corp. at Yonkers, N. Y. The new structure, now in operation, houses complete modern equipment for testing all important characteristics of modern gasolines, including the several present ratings for octane equivalent.

Besides analyzing fuels, the new laboratory will serve as a control station for correlating the findings of tests on gasoline samples which are taken from all parts of the country and analyzed in the five other district laboratories of the Ethyl Corp. These are located at Detroit, Baton Rouge, Kansas City, Tulsa, and San Bernardino, Calif.

The new Yonkers test laboratory contains about 10,000 sq. ft. of floor space for apparatus, shops and offices. It replaces an older building elsewhere which served for many years as the original Ethyl research laboratory and which saw the beginning of several research projects which have now become significant in the development of the automobile. Hudson Kellogg is in charge of the gasoline-testing activities of the new laboratory, and John C. Pope is in charge of the control activities of this and the other testing laboratories.

Another Divorcement Bill Introduced in Congress

WASHINGTON, D. C., April 8.—Another petroleum divorcement bill has been added to the series of such measures now pending in Congress in the form of a bill (S. 3718) introduced by Sen. Guy M. Gillette of Iowa to prohibit producers, refiners and marketers of petroleum products from operating tankers and barges.

The bill is an outgrowth of dissatisfaction of marketing interests with the recent large increases in tanker freight rates from the Gulf Coast to North Atlantic ports. There appears to be little prospect the bill will receive committee consideration in time for action at the present session of Congress, but the fact a number of divorcement bills and resolutions for investigation of petroleum shipping rates are pending in Congress may be used as an argument for intensive consideration of the subject in case transportation charges continue to increase.

Natural Gasoline

Ten-Year Nonaccident Record at Shell Plants

Completing 10 years of continuous operation without a single disabling injury, Shell Oil Co., Inc., employes at the two Bryan gasoline plants near Skellytown, Tex., recently established an outstanding record in the history of the natural-gasoline industry. Eight employes at these plants have participated in the entire 10-year record. They are Reuel Casey, Elisha C. Bonner, A. R. Givens, John B. Roe, Thomas L. Allison, Oscar E. Carlson, Fred L. McCarty, and Kell A. Sorensen.

C. E. Smith has been superintendent of these plants since January 1938. Prior to that date the plants were successively under the supervision of M. R. Church, now general superintendent of gasoline plants in the Texas Gulf area, and C. E. Haines, now superintendent of the Magnolia plant in Arkansas.

During the 10 years there was a total of 441,400 man-hours, and if the normal experience of the petroleum industry be taken as a criterion, there could have been seven disabling injuries. From the company's viewpoint, avoiding these injuries represents a tangible saving in accident expense of $2,000, and it represents much more in morale and operating efficiency.

The men who made this record have benefited in health, happiness, and comfort, and have not incurred the loss of income resultant from accidents. As compared with normal industry experience, the saving in wages alone has been $1,200.

Lone Star Gasoline Co. Installs Copper Sweetening Unit

DALLAS, Tex.—A 25,000-gal. per day capacity Perco copper sweetening unit has been installed in the Brooks gasoline plant at Breckenridge, Tex., according to an announcement of the Lone Star Gasoline Co. This unit was installed under a license of Perco, Inc., Bartlesville, Okla.

Federal Threat Now Suspected In Suggestion by President

By HENRY D. RALPH

WASHINGTON, D. C., Apr. 8.—President Roosevelt's attempt to secure action on the Cole oil-control bill at this session of Congress by suggesting it be revised to remove some of the opposition has revived the threat of federal regulation in a more insidious form than the direct action first proposed.

While the new proposal appears on its face to be less sweeping and objectionable, and while it may appeal to some oil interests, observers view it as only the entering wedge—and a big wedge at that—for complete federal control. The president's suggestion is that the federal Government establish conservation standards for oil production and if the states do not adopt and enforce these standards their oil be denied shipment in interstate commerce.

The intended inference is that there would be no interference with states now having conservation laws, but that states like Illinois and California would be forced to enact statutes limiting their production. The political purpose of this is to quiet the opposition of the oil-state governors and possibly to enlist the active support of oil producers who are losing their markets to flush Illinois production. This idea might be "sold" to many members of Congress on the ground that it is a compromise which will preserve the national public interest in conservation of petroleum without interfering with the rights of states which make an attempt to exercise their rights to promote conservation.

Insidious Proposal

The insidiousness of this proposal is that, if enacted, it would give the Department of the Interior a control over all oil production which, for all practical purposes, would be as great as that sought in the original Cole bill and one which conceivably might rest on a sounder constitutional basis and be more apt to be upheld by the courts since, as the president pointed out, it could be viewed as simply an extension of the Connally Act. By setting the standards for conservation, the Government could force every oil state to revise its laws, and these could be made uniform throughout the country without consideration for local conditions. Further than this, the president proposes that shipment be denied oil from states which fail to enforce their laws in the way desired by the Interior Department.

In spite of the political strategy involved in the proposal, there appears to be little chance that Congress will enact any oil-control legislation at this session. The subcommittee which held hearings on the Cole bill has not yet officially closed the hearings, and Chairman Cole has announced the committee will not reach a final decision until these hearings are indexed and printed, a process which may require several weeks. Even if a compromise bill is drafted and reported out by the subcommittee it is unlikely House leaders will give it a place on the calendar unless it appears there will be only limited opposition. In the hope of adjourning as early as possible, controversial legislation is being kept to a minimum. White House pressure, however, might be exerted to bring the bill up for a vote.

Another interesting aspect of the president's proposal is that it includes the provisions of the Cole bill for reorganizing the activities of the Interior Department concerned with petroleum and this would give the secretary a compact, stream-lined agency for enforcing whatever control powers may be voted by Congress now or later.

The president's proposal was contained in an exchange of letters released last week by Rep. William P. Cole, Jr., of Maryland, author of the original bill (H.R. 7372) and chairman of the subcommittee which held hearings on the bill.

On March 4 the president wrote Mr. Cole that since introduction of the bill last summer, "subsequent events have sharpened my conception of the tremendous importance of petroleum to the present and future well-being of our country." He added:

"I am hopeful that your subcommittee will frame suitable legislation to assure the efficient production of oil and gas from our petroleum reserves, which will give due recognition to the views expressed at your hearings by the officials of the oil-producing states and representatives of the oil industry. The proper coordination of federal and state responsibilities in oil conservation, without impeding the oil industry in the continued improvement of its technological processes, and keeping in mind the welfare of those employed in the oil industry and the needs of consumers, is a problem which requires the best thought and effort. I am confident that you can segregate the essential considerations of this problem and provide an adequate solution."

President's Position

On receipt of this letter Mr. Cole, at the direction of the subcommittee, wrote the president asking if he was aware of the strenuous opposition of the oil states and the industry when he asked that legislation be framed giving due consideration to their views. In reply President Roosevelt wrote Mr. Cole, under date of March 26, as follows:

"In answer to the first question raised by your committee, I am glad to tell you that, when I wrote you recently, I was aware of the statements presented to your committee by officials of oil-producing states and representatives of oil-trade associations in opposition to the bill H.R. 7372. I had the pleasure of talking personally with some of these gentlemen and learned directly from them their attitude toward this measure.

"My letter of March 4, 1940, was written with the thought that the members of your committee, most of whom have been in touch with the problems of oil and gas conservation since 1933, on the basis of that experience could frame suitable legislation, with H.R. 7372 as a guide, which would go a long way toward meeting the essential objections of those who opposed that measure but which would adequately prevent the wasteful production of oil and gas and assure permanently the conservation of our petroleum resources.

"Your committee asks whether this thought suggests a different approach to the problem, from a legislative viewpoint, than that embodied in H.R. 7372. My answer would be that a modification of the enforcement procedures rather than of the objectives of H.R. 7372 is suggested.

"As introduced by you at my request, H.R. 7372 provides for the establishment in the Department of the Interior of an office of petroleum conservation and the transfer to that agency of the units of the federal Government now engaged in oil conservation; and outlines the functions of that office in the assembly and dissemination of information and the conduct of research and investigations in matters relating to petroleum and petroleum conservation, including the reporting to specified state authorities of oil-production practices found to be wasteful. These provisions parallel closely the corresponding provisions of the measure which your committee drafted and recommended in 1935 and it is my understanding that no material objection has been offered to them.

Principal Objection

"As I understand the controversy over H.R. 7372, there is little objection to the federal Government prescribing, in order to conserve our petroleum resources, standards of production to which oil producers should conform as a condition to the shipment of their oil in interstate commerce. The principal objection to the proposed legislation seems to be that it provides for federal enforcement of these standards in all fields regardless of the adequacy of state enforcement of such standards.

"This being the case, I should think that it would be possible to agree that the standards of production necessary to qualify oil for shipment in interstate commerce should be prescribed by the federal Government but that these standards should be enforced by the federal Government only if an authorized federal agency finds that the states have failed to enact laws requiring conformity with federally prescribed standards or have failed persistently to enforce compliance with such standards when required by state laws. Insofar as the states fail to enact or enforce oil and gas conservation laws requiring conformity with the standards prescribed by federal law, I should think that oil producers should be given the right to qualify their oil for shipment in interstate commerce by entering into voluntary agreements, subject to the approval of the authorized federal agency, to conform with such standards. Legislation along these lines would in effect be an extension of the principles of the act of February 22, 1935, generally known as the Connally law.

"I hope that this approach will be helpful to your committee and that it will aid you in framing promptly suitable and adequate legislation which will receive the support of your committee and of the Congress."

Discovery on Small Geophysical Structure Arouses Mississippi

By GEORGE WEBER

JACKSON, Miss., Apr. 8.—The discovery of oil production on a relatively small structure indicated by geophysics has precipitated a new interest in Mississippi's possibilities. The importance of the discovery by Kingwood Oil Co. in eastern Yazoo County goes far beyond the addition of the state's second oil field. Its effect on interest in the state is more profound, marking a definite turning point in opinion regarding the state's potentialities.

Several days ago, Kingwood Oil Co.'s No. 1 R. E. Wilburn, located 330 ft. from the NE cor. Section 31-12n-3e, about 25 miles northeast of Tinsley, encountered an oil show in the Eutaw formation. A drill-stem test made at 4,871-92 ft. showed recovery of 900 ft. of oil and 40 ft. of oil-cut mud in 10 minutes, using ¼-in. chokes top and bottom. With the hole bottomed at 4,889 ft., operators set 7-in. casing to 4,873 ft. and drilled out and ran 2-in. tubing late last week. On latest reports, the well washed about 5 bbl. hourly making oil and wash water, but apparently had ceased flowing, and operators were preparing to swab Monday noon. Although the well is not yet definitely on production, its possibilities for opening the state's second oil field are considered certain.

The Kingwood discovery, officially named the Pickens field, for a town by that name lying a few miles to the northeast, may not in itself constitute a major oil discovery. This is generally assumed from the relatively small extent of the geophysical structure outlined, and the small amount of uplift which the structure shows. It is, however, considered by authoritative geologists to hold as great if not greater importance than the Tinsley discovery, as regards interest and future development in the state.

This importance may be explained on the basis of the trend of thought among operators watching Mississippi. The long-expected play, which was touched off last autumn by the discovery of Mississippi's first commercial production, has resulted in the leasing of several millions of acres comprising hundreds of blocks located on geophysical or surface-geology data. The play has been sustained without any additional discoveries. While many major companies and established independent operators have taken part in the activity, another class of oil interests, while interested in the state, has watched it closely, but has either withheld from active participation or has entered it with reservations.

Tinsley Represents Unusual Case

This attitude may be explained by conditions as they were prior to the Kingwood discovery. Tinsley represents an unusual case in many respects. Its structure is large and well defined from surface geology, as is the structure of the Jackson gas field. It was believed by many that smaller structures, later discovered by geophysical methods, had small chance for potential oil production, since none had yet shown any such indication. Although a very small percentage of this class of structure now outlined had been drilled, the opinion persisted.

Therefore, the Kingwood strike, made on a structure which showed neither great extent nor a pronounced uplift, has crystallized action in this class of operators and has greatly accelerated the work of those who were already participating in the play. It proves that small prospects, of which there are several hundred, are capable of production, in addition to the larger structures which are evident from surface geology and subsurface information. The turning point was evidenced immediately by the requests for information from widely distributed sources.

The most immediate effect which the late development will show on Mississippi's activity will be an increase in wildcatting activity. This work, based on several months of assembling blocks and shooting potential areas, was due for consistent increase in any event. Those who have assembled blocks may change plans for more immediate drilling. A marked increase in wildcatting, however, may be expected to arise from the outside interest entering the play.

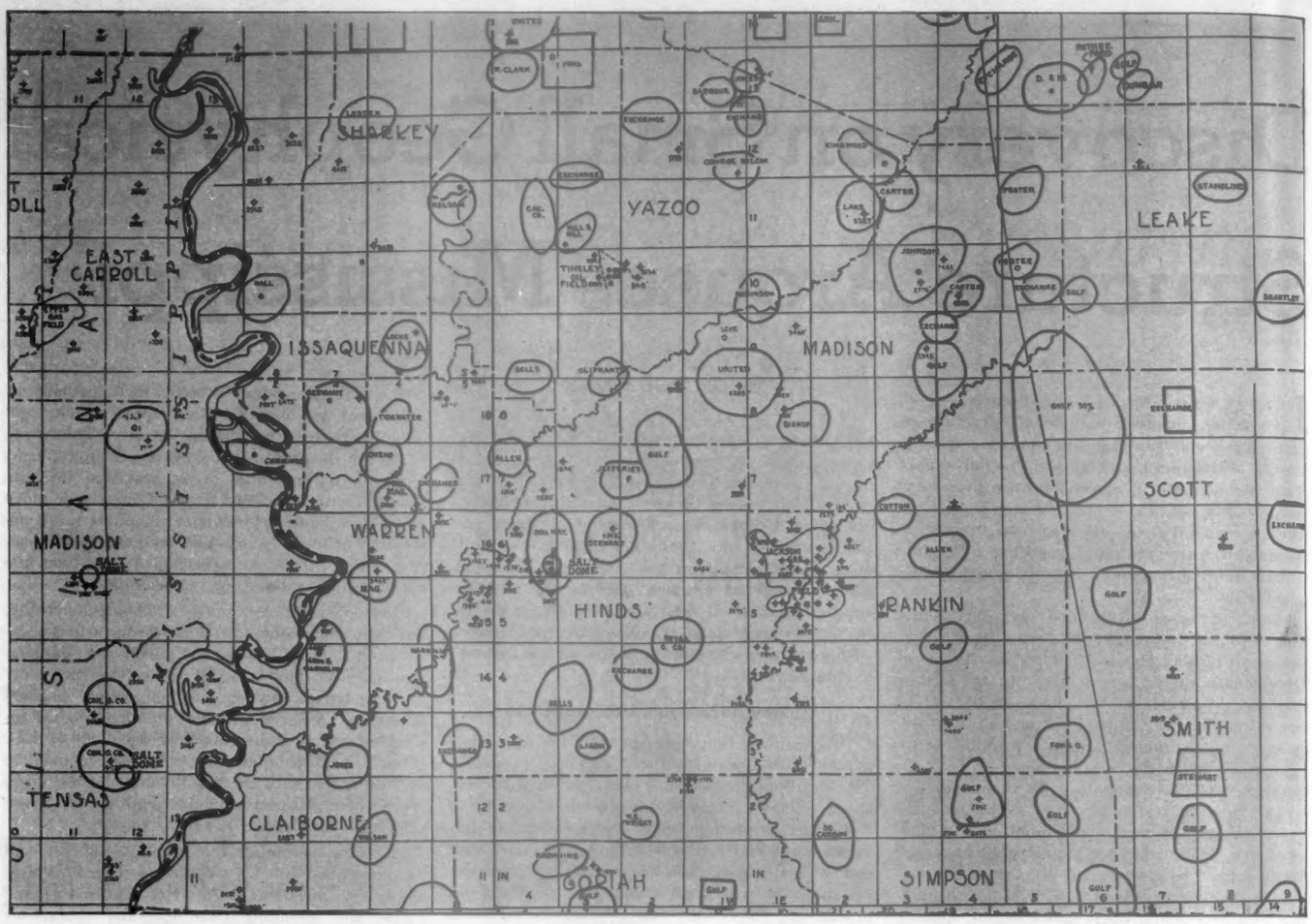
These operators who have watched the activity, but who have done little blocking, will be influenced to enter leasing and geophysical exploration shortly. However, as protection they may be expected to buy spreads on already blocked prospects. A large number of such blocks, assembled and awaiting financing from sale of such spreads, will thus be assured more immediate drilling dates, with the result that wildcatting on established prospects should begin to show acceleration within the next few days.

The area receiving the greatest interest will be the central and west central section of Mississippi, with most intense activity centered around Yazoo and adjoining counties. The Cretaceous horizon generally will be the object of primary interest over the next several months. Later, other prospective sections, dependent largely on success of current wildcats, may enter the play. Of these areas, the Paleozoic possibilities of North-

Above: Compact pumping units are well adapted to the artificial lift required in the Tinsley field. Many wells so equipped need only preliminary agitation before kicking oil, but later will need full pumping. This picture shows Union Producing Co.'s No. 3 Woodruff

Below: The diesel rig which drilled the Kingwood well discovering oil in the Eutaw formation at 4,871-92 ft.

Above: Eutaw formation wells, such as this one, have water trouble and required heating units as well as pumps



Hundreds of lease blocks throughout Mississippi await drilling. The discovery of oil in a small structure such as the Pickens has greatly enhanced the possibilities of further discovery in the state. This section of a state map shows the blocks in the Yazoo County and adjoining area.

east Mississippi and Northwest Alabama may be mentioned as likely objects of interest.

Clark County Wildcat

Interest is shifting this week to an important wildcat drilling in Clark County, in southeastern Mississippi, near the Alabama border. Arkansas-Mississippi Oil Co.'s No. 1 State, in Section 16-2n-16e, is drilling below 2,820 ft. in chalk, and is approaching critical depth at about 3,500 ft., where chances, from indications of former wildcatting in the area, are considered good for another discovery. Numerous other wildcats drilling throughout Mississippi are being watched closely, and Alabama is coming more strongly into the picture, with an active test in the coastal section near Mobile, and the deepening of an old wildcat in Choctaw County by Union Producing Co.

Tinsley

The Tinsley field, heretofore prominent mainly as Mississippi's first commercial oil field, is entering a development stage which may reveal sizable oil reserves to give it a more intrinsic importance. During the past week four good wells were completed in the Woodruff sand, extending the field in three directions.

A study of the Woodruff sand in the field, as currently developed, shows possibilities for greater importance in outlying areas. Although irregularity of the sand, and faulting render outpost and even offset operations hazardous, the general trend in the Woodruff sand indicates better production under edge acreage, particularly to the north and west.

The sand shows a definite thickening outward to the east, north and west from a restricted area in the center of the field, where it is missing altogether. To the east, the only direction in which the field is defined at present, the sand thickens but dips to the water level. The thickening of the sand is most important to the northwest of discovery, where one well with 103 ft. of saturation, and two nearby wells with 70 ft. of oil sand each, indicate greater reserves to be found.

A low reservoir pressure in the Woodruff horizon has necessitated equipping approximately half of the Tinsley wells with pumping units, although many wells so equipped are still flowing, or flow with slight agitation. This characteristic has given the impression to many observers that the field's importance was limited as an oil reserve, but the indications of large volumes of oil in place, to be produced by artificial lift over a long period, show the true importance of the field.

With this improvement in prospect for production at Tinsley, coupled with the possibilities for added reserves in other fields in the area, a definite entry of refining operations to the state may be expected within the next few months.

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Compact Commission Outlines Constructive Program

(Continued from Page 13)

principles for the uncertainties of interpretation which in the past have inevitably brought pressure upon the regulatory bodies for exceptions and divergencies. Adoption of such technologic principles would be of material assistance in formulating sound administrative law in conformance with the terms of the constitutions and conservation statutes."

The following will compose the committee on proration practices:

Oklahoma.—Governor Phillips, chairman; Reford Bond, chairman Corporation Commission; Dr. Victor E. Monnett, director school of engineering, University of Oklahoma.

Colorado.—H. C. Bretschneider, member regulatory body, Colorado; Dr. F. N. Van Tuyl, University of Colorado.

Kansas.—Andrew F. Schoeppel, chairman Corporation Commission; Dr. Eugene A. Stephenson, University of Kansas.

Michigan.—P. J. Hoffmaster, director of conservation; Dr. R. A. Smith, state geologist.

New Mexico.—Alexander Andreas, state geologist; Dr. C. E. Needham, president School of Mines, New Mexico.

Texas.—Col. Ernest O. Thompson, Texas Railroad Commission; Dr. E. De Golyer, University of Texas.

Chairman Phillips was authorized to appoint a committee on standards. He appointed members of the commission to the following regular committees: Coordination, conservation, supply and demand, and imports and exports.

Attacks Cole Bill

Col. E. O. Thompson, member of the Texas Railroad Commission and member of the compact from Texas, in one of the principal addresses of the meeting condemned the pending Cole bill providing for federal control, and presented a strong defense of conservation as carried out by the states and the Compact Commission.

Compact members who attended the meeting in addition to Governor Phillips and Colonel Thompson included W. M. Downing, Colorado; Andrew F. Schoeppel, Kansas; P. J. Hoffmaster, Michigan; Hiram M. Dow, New Mexico, and W. J. Holloway, Oklahoma.

You are invited

For years the Dubbs cracking process has been making the highest yield of the best gasoline from any kind of charging stock, and at lowest cost, royalty and all—and it still does

Now the U. O. P. catalytic poly process goes on from there—it makes super-octane polymer gasoline from the cracked gases

And U. O. P. inhibitors police the gasoline—keep the gum all out and the anti-knock value all in—and they don't rob you of any of the gasoline

Use Our Processes

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

PROGRAMS AND MEETINGS

Entirely New Oil Exhibit for New York World's Fair

An entirely new exhibit, designed by Walter D. Teague, is being built by the Petroleum Industry Exhibition at the World's Fair of 1940 in New York which opens May 11, it was announced by T. H. Taylor, exhibit president.

"New lighting and color scheme will enliven the great, luminous blue, three-sided building both inside and out," he said. "Four giant oil tanks will hold exhibits covering several of the dramatic phases of oil which will be so presented as to contrast sharply the swift, sure comforts of today with the slow uncertainties of the past. No laborious and heavy-handed explanations will be used; instead, the developments of the past and expectations for the future will be disclosed through lively conversations between commentators.

"A huge map sculptured with mountains and streams, dotted with miniature derricks, will indicate the principal regions from which oil comes. Across the map tiny engines pull long lines of tank cars from the production areas to refineries. Miniature tankers cast off from ports and plow through the waters of the Atlantic, Pacific and Gulf. Illuminated tubes criss-cross the country to show the vast network of pipe lines bringing oil to population centers.

"Near the map a miniature refinery stands where visitors may see some of the important operations necessary in transforming the thick, black crude oil into everything from high-pressure grease to lip-stick or delicate soap.

"In the great hall a technicolor musical revue will be shown every hour. As the revue on the screen ends, the fanciful music will be picked up in each of the separate exhibits. Lights will gradually grow from dim to bright, and the novel presentations of the several displays will begin. In one an airplane will start from New York to Trenton. In another the precise machines of a modern industrial plant will start to turn. In aother the daily life in a typical farm home will begin. And in a fourth, the point at which the public best knows the petroleum industry, the filling station, will go into operation."

Texas Oil's Forty-fifth Birthday Will Be Celebrated

Texas oil's forty-fifth birthday will be observed by the oil men of the state in the 1940 convention of the Texas Mid-Continent Oil and Gas Association at Fort Worth, October 31 through November 2, E. L. Smith, president, announced.

Shiarella Elected President of Kentucky Oil Association

N. W. Shiarella, Owensboro oil man and member of Miller & Shiarella Co., Owensboro, was elected president of the Kentucky Oil and Gas Association at the annual meeting held at the Brown Hotel, Louisville.

Other officers elected follow: Vice presidents, M. A. Arvin, Snowden & McSweeney Co., Owensboro; M. G. Powers, Bed Rock Petroleum Co., Huntington, W. Va., and P. C. Van Gilst, Kentucky-West Virginia Gas Co., Ashland; secretary, E. L. McDonald, Ashland Oil & Refining Co., Lexington; assistant secretary and treasurer, Paul D. Bushong, Owensboro.

New directors from western Kentucky include: W. K. Snyder, Stewart & Snyder; C. Taber Johnston, Mecca Oil Co., Owensboro; and J. Fred Miles, Petroleum Co., Louisville, Ky.

Holdover directors from western Kentucky are: M. A. Arvin, Snowden & McSweeney Co., Owensboro; Joshua Bailey, Joseph B. Mayer Co., Owensboro; H. T. Downing, Onsel Brothers & Downing, Bowling Green; W. E. Hupp, Hupp & Duff, Lexington; J. J. McClelland, Ohio Oil Co., Owensboro; Carl A. Morrison, Producers Pipe Line Co., Owensboro; J. W. Polkinghorn, Kentucky Natural Gas Co., Owensboro; N. W. Shiarella, Miller & Shiarella, Owensboro; C. J. Weideman, Cumberland Petroleum Co., Owensboro; J. Frank Wilson, Sohio Corp., Mount Vernon, Ill.

Other new directors include: W. A. Watkins, Carter Oil Co., Mattoon, Ill.; E. J. Reading, Sun Oil Co., Evansville, Ind.; O. F. Beaty, Magnolia Petroleum Co., Evansville, Ind.; H. A. Wallace, Jr., Warfield Natural Gas Co., Charleston, W. Va.; and Osman D. Schwartz, United Carbon Co., Charleston, W. Va.

Holdover directors from eastern Kentucky are: E. J. Evans, Evans Oil & Gas Co., Paintsville; M. W. Fowler, South Penn Oil Co., Irvine; A. V. Hoenig, Hoenig Oil Co., Bartlesville, Okla.; O. H. Horne, Inland Gas Co., Ashland; W. H. Keffer, Ashland Oil & Refining Co., Ashland; E. L. McDonald, Ashland Oil & Refining Co., Lexington; M. G. Powers, Bed Rock Petroleum Co., Huntington, W. Va.; P. C. Van Gilst, Kentucky-West Virginia Gas Co., Charleston, W. Va.; H. C. Wakefield, Texas Co., Pryse; Earl D. Wallace, Petroleum Exploration Co., Lexington; J. A. Yunker, Louisville Gas & Electric Co., Louisville; and George C. Collins, Collins Oil Co., Frankfort.

South Texas Oil Jubilee To Honor Al Buchanan

John R. Suman, of Houston, Tex., vice president of Humble Oil & Refining Co., and Walter P. Napier, president of Alamo National Bank, San Antonio, Tex., will be principal speakers at the third annual South Texas Chamber of Commerce Oil Men's Jubilee banquet Friday, April 19. The 1940 jubilee will especially honor Al Buchanan, San Antonio oil operator and drilling contractor, who also is a South Texas Chamber vice president.

F. M. Frasher is chairman and E. E. Keator vice chairman of the committee on arrangements. Other members are Herschel E. Cooper, Lamar Snelligan, Rodney DeLange, Joseph S. Morris, G. F. Mortimer, San Antonio; W. M. Griffith, Sinton; George A. Hill, Jr., Houston; L. W. Dirks, Tuleta; Tom Graham and Herman Heep, Corpus Christi; John J. O'Hern and O. W. Killam, Laredo.

I.P.A.A. Annual Meeting In Dallas in October

Dallas, Tex., has been selected for the eleventh annual convention of the Independent Petroleum Association of America, October 16-18.

MAGNETIC STORM

TUCSON, Ariz., Apr. 4.—Severe storm began April 3 at noon and ended April 4 at 5 a.m. central standard time.

CALENDAR OF EVENTS

April

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, Petroleum Division, University of Oklahoma, Norman, Okla., April 12-13.

SOUTHWESTERN GAS-MEASUREMENT SHORT COURSE, University of Oklahoma, Norman, April 16-18.

NATIONAL PETROLEUM ASSOCIATION, semiannual meeting, Cleveland Hotel, Cleveland, Ohio, April 18-19.

PENNSYLVANIA STATE COLLEGE, ninth Petroleum and Natural Gas Conference, State College, Pa., April 26-27.

May

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Dallas, Tex., May 1-3.

NATURAL GAS SECTION, AMERICAN GAS ASSOCIATION, thirty-fifth annual meeting, Houston, Tex., Rice Hotel, May 6-10.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, thirty-second semiannual meeting, Statler Hotel, Buffalo, N. Y., May 13-15.

NATURAL GASOLINE ASSOCIATION OF AMERICA, annual convention, Hotel Tulsa, Tulsa, May 15-17.

INTERNATIONAL PETROLEUM EXPOSITION, Tulsa, May 18-25.

AMERICAN PETROLEUM INSTITUTE, midyear meeting, Fort Worth, Tex., May 27-31.

NATIONAL OIL SCOUTS AND LAND MEN'S ASSOCIATION, annual convention, Hot Springs, Ark., May 30-June 1.

June

ILLINOIS-INDIANA PETROLEUM CONFERENCE, eighth annual meeting, Robinson, Ill., June 1.

SOCIETY OF AUTOMOTIVE ENGINEERS, summer meeting, The Greenbrier, White Sulphur Springs, W. Va., June 9-14.

SOUTHWEST PETROLEUM CREDIT GROUP, San Antonio, Tex., June 17-20.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, Milwaukee, Wis., June 17-20.

AMERICAN SOCIETY FOR TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 24-28.

September

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, Spokane, Wash., September 3-6.

AMERICAN CHEMICAL SOCIETY, Detroit, Mich., September 9-13.

NATIONAL PETROLEUM ASSOCIATION, thirty-eighth annual meeting, Hotel Traymore, Atlantic City, N. J., September 18-20.

October

NATIONAL SAFETY CONGRESS, Stevens Hotel, Chicago, October 7-11.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, eleventh annual meeting, Dallas, Tex., Oct. 16-18.

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, annual convention, celebrating Texas oil's forty-fifth birthday, Fort Worth, Oct. 31-Nov. 2.

November

AMERICAN PETROLEUM INSTITUTE, twenty-first annual meeting, Stevens Hotel, Chicago, November 11-15.

25th MEETING of A.A.P.G.

S.E.P.M.

S.E.G.

Chicago April 9-12

Foreword

By W. V. HOWARD, Ph.D.
Associate Editor

IT is no coincidence that the birth of the American Association of Petroleum Geologists a quarter of a century ago was very nearly contemporaneous with the birth of modern geology. During the century which preceded the development of petroleum geology, the science was very largely an academic one, except in the highly technical field of ore deposits. Except where man had actually penetrated the surface of the earth in mines and in a few scattered localities where there were supplies of artesian water, the observations of geologists were restricted to the earth's surface. There was no lack of speculation regarding the rocks beneath that surface, but that speculation was based upon observations at the surface and theories which were dependent largely upon logical argumentation.

The increasing requirements of the world for oil made demands upon the geologists of that time which they could not meet, for the drill had a disturbing habit of refuting the most logical of reasoning. Oil operators demanded accuracy and where the science did not permit accuracy it was necessary to invent sciences which did. The geologists of the war period and that immediately following rose to the occasion. Facts that had hitherto escaped notice were pounced upon and used and new ways of discovering additional facts were developed.

Almost immediately the need was recognized for a forum where this rapidly accumulating knowledge could be disseminated and discussed. The older societies had become firmly established, and were not sufficiently elastic to absorb the new developments. To meet this need the American Association of Petroleum Geologists was formed.

The development of new sciences, such as micro-paleontology and exploration geophysics, since the time of formation of the association, is an old and well-known story today. The birth and rapid growth of 21 local geological societies affiliated with the association are accepted as a natural occurrence amid so active and energetic a group. The efficiency of the petroleum geologist is plainly observable in the statistics of increasing proved reserves of oil. What is, perhaps, not so generally realized is the fact that the petroleum geologist has contributed greatly to the quantitative development of his science.

Subsurface geology, which today enables us to predict, with an error of less than 1 per cent, where formations will be encountered several thousand feet below the surface, would have been considered absolutely impossible 30 yars ago. Paleogeographic maps showing approximate shore lines over a period of one-third of a geological period are now considered so crude as to be practically worthless to a generation which seeks, and finds, sand bars and beaches laid down in a few fleeting moments of geological time. Structures which never would have been noticed by the old school of geologists are mapped today and their outlines projected far into the earth. Fossil groups which were formerly regarded as of no value in delimiting geological periods are now used in locating individual beds within a system.

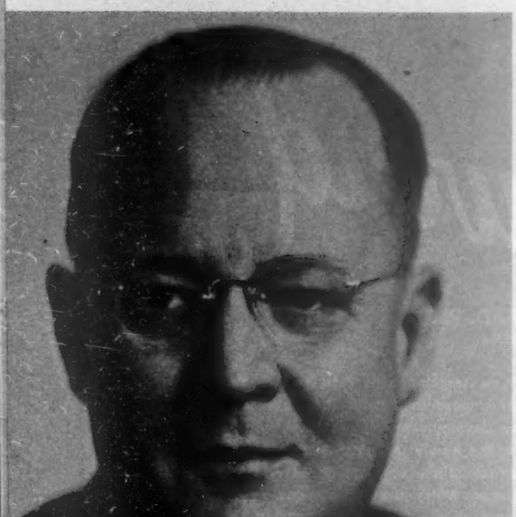
Still the petroleum geologist is far from satisfied. He recognizes, more probably than any other person, that he has just begun to learn. In his desire to know more, he has stimulated the oil industry into undertaking a program of research that is far beyond the capacity of the nation's universities and surveys. He has thoroughly proved the value of the research program.

To attribute all of the advances of geology to the petroleum geologist and to his association and its affiliated organizations would be to claim too much. That they have impelled geologists everywhere to a steady and broadening progress is an undoubted fact. There is also no doubt that wherever the science may develop in the future the petroleum geologist and his allies will be in the forefront.

A.A.P.G.'s Growth Parallels Ex

Of Petroleum Ge

Headed A.A.P.G. During Its First Formative Year



J. ELMER THOMAS

Following his graduation from the University of Chicago in 1912, J. Elmer Thomas, first president of the American Association of Petroleum Geologists, spent 1 year as a mining geologist in Mexico. Returning then to the United States, he entered the oil business as geologist for Minnehoma Oil Co. Later he was chief geologist for Chicago Oil Co. and Sinclair Oil & Gas Co. During the World War he was a second lieutenant in the photographic branch of the air service.

Upon demobilization Mr. Thomas opened an office as a consulting petroleum geologist in San Antonio, Tex. In 1920 he moved to Chicago, where he remained until 1925 as a consultant and also chief geologist for Shaffer Oil & Refining Co. Returning to the Southwest, he became an independent operator, with headquarters in Fort Worth, Tex.

His flair for economics, combined with his knowledge of geology and the oil business, resulted in Mr. Thomas being retained as petroleum analyst by the New York Stock Exchange firm, Fenner & Beane, from 1928 to 1930. After that he conducted oil explorations in western Europe as vice president and general manager of Bavarian Oil & Gas Co. Returning to Texas in 1933, he set up office in Houston as independent operator and consulting economist. His residence is in Fort Worth.

In 1930, he was appointed chairman on petroleum economics for the Federal Oil Conservation Board. In 1933 he was a member of the Petroleum Administrative Board and special technical adviser to the oil administrator under the N.R.A. In 1937 he was official delegate to the Second World Congress, Paris, and to the Seventeenth International Geological Congress, Moscow.

By J. ELMER THOMAS

THE American Association of Petroleum Geologists has a membership today of 3,246, residing in 43 states of this nation and in many other countries throughout the world. It is the largest and most active organization of geologists anywhere. Its monthly bulletin has always maintained a high standard of excellence and is widely read by members and others. It also publishes from time to time special volumes on subjects of major interest. While only a brief number of years bridges the span from its humble beginnings, the association's history parallels the period of greatest expansion in the oil industry and greatest improvement in exploratory technique.

In October 1915 the writer, then a resident of Tulsa, invited to dinner 30 friends who were active as petroleum geologists, principally in northern Oklahoma, for the expressed purpose of fostering friendship within our ranks and of permitting the mutual benefits that would arise from the occasional exchange of data and ideas in a profession then quite new but expanding rapidly in the Mid-Continent oil fields. Courses in petroleum geology were not then offered at the leading universities and most of the geologists had not enjoyed specific training in this specialized subject. Beginning in 1913, geologists had been employed in the Mid-Continent area, but by only a few of the larger companies, and the smaller companies and the independent operators were not prompt in following that lead. About 15 years earlier W. W. Orcutt had been employed by the Union Oil Co. of California, and E. T. Dumble had organized a staff for the Rio Bravo Oil Co. (Southern Pacific) in the Gulf Coast, but the practice was by no means general.

At the October 1915 dinner a suggestion was made by James H. Gardner, if the writer's memory can be trusted for 25 years, that a geological society be formed, but organizing was deferred and Charles H. Taylor, then head of the department of geology at the University of Oklahoma, announced that within a few months he would call a conference for geologists working in the Southwest, to convene at Norman. At about this same time, or perhaps somewhat earlier, E. De Golyer, then chief geologist of the Mexican Eagle Oil Co. at Tampico, had been in Oklahoma and had suggested to Professor Taylor that the growing number of geologists in the Southwest should organize an association.

Organization of the Association

Professor Taylor called the conference for January 7-8, 1916, which was held at Norman with about 60 geologists in attendance. No organization was perfected there but a technical program, not confined to petroleum geology, had been arranged and many of its papers were later published in the association's bulletin. Subsequently this came to be regarded as the first meeting of the association, since a committee was selected there to call another meeting a year later and again to provide for a technical program, of which committee Professor Taylor was chairman. The second meeting convened in Tulsa February 9-10, 1917, with about 90 geologists present, the Southwestern Association of Petroleum Geologists was organized and officers elected. Professor Taylor had taken the principal initiative in the entire matter and should rightfully be considered the "father" of the association.

During the following year the membership had doubled, including not only men working in Oklahoma, Kansas, and Texas, but also representation from various other oil centers from New York to California. The need for such a society, and for the periodic publication of the proceedings of its meetings, seemed widespread, and its name accordingly was changed to the American Association of Petroleum Geologists at the third meeting, in Oklahoma City, February 16-17, 1918, when about 180 geologists were in attendance and a constitution was adopted. The little toddler had become quite a lusty child and was destined to exert an important influence on the progress of geologic thought and on the growth of the oil industry.

Earliest Geological Work

Just then the accelerated expansion of the automotive industry and wartime needs were calling for sharply increased supplies of oil and the impact of this demand had to be met largely by new fields in the Mid-Continent area. Little had been published on the geology of oil fields in those districts, although some careful field work had been done and some excellent reports written a decade or two earlier, chiefly by members of the U. S. Geological Survey, on producing areas located principally in the Appalachian region and in the West, Wyoming and California. We inherited a working knowledge of the anticlinal theory, but we did not recognize immediately that important oil accumulation existed in some Mid-Continent fields on other than anticlinal structure. Some study had been given to the origin and nature of salt domes, with which most of the oil fields in the Texas-Louisiana Gulf Coast were associated, but they were imperfectly understood 25 years ago. Very little thought as yet had been directed to the twin questions, the source and migration of oil, though it must be admitted that those problems still are far from solved today.

Oil-field structures in the Mid-Continent districts were much smaller and less sharply folded than those in the Appalachian areas, and in the Rocky Mountain regions and California, which had been mapped and described earlier. The geologists working around Tulsa in 1915 devoted most of their attention to a search for east dips, which, with the normally westward-dipping formations, indicated an anticline. Some attention to the probable depth and thickness of prospective pay sands led to agitation for better well logs, to afford more accurate information on the formations penetrated. Correlation charts of the various producing horizons were made; then, with depths and elevations known, contoured maps of them were prepared.

Expansion of Geology

Next came rudimentary subsurface studies, useful not only in developing new fields but also in discovering other favorable structures from the evidence obtained from such dry holes as had been drilled nearby. Such subsurface studies, which occupy so much of the time of a large number of geologists employed today, were then based solely on the information reported in "drillers' logs." As of 25 years ago the Mid-Continent district had not witnessed, and scarcely could have imagined, such things as "sample logs," micropaleontology and micropetrography, solidly cored tests, porosity and permeability determinations, thermal measurements, the entire field of geophysics — seismic, gravimetric, magnetic and electrical—supplying other means of mapping subsurface structure before tests are drilled, analyses of connate waters, electrical resistance profiles, as well as the newer methods of radioactivity measurements, spectroscopic analyses and fluroscopic indications.

Competition, multiple effort and ingenuity rapidly brought about expanding activities and improving technique. The principal thought of the founders of the young association had been to provide a forum for the exchange of ideas and a publication wherein could be reported new theories and practices as well as our ever-increasing accumulation of data, scientific, technical and economic. Well has it fulfilled those functions and many others, such as establishing a code of professional ethics, acting as an "employment bureau," sponsoring research with appropriations of its own funds, providing a revolving fund for the publication of valuable material in unit volumes besides issuing a regular monthly bulletin containing papers presented at its own annual and midyear meetings, encouraging the establishing of numerous local societies of petroleum geologists, some with memberships now in excess of 300, as well as affiliating with national technical societies of allied professions such as the paleontologists and geophysicists.

The fundamental basis of any natural science is the assembling, classification and analysis of physical data and this requires the labor of many men. The science of petroleum geology has been developed mostly in the oil fields and pricipally by men commercially employed. Laboratory research, conducted by corporations, universities, and other institutions, has assisted largely, but it all began with the collecting of facts in the field. The history of the American Association of Petroleum Geologists is the story of the growth of a new science, of young and adventurous men with imagination—students, not "experts"—constantly reaching out for new tools of search and research. During the first half of the past quarter-century we were hard pressed at times to keep up with consumptive requirements; during the last half we have remained slightly ahead. It would call for a bolder prophet than this writer to forecast the situation a quarter of a century hence.

It has been well said that there are dual phases in oil discovery: first, selecting a favorable location and, second, drilling a test that makes a well. Specialists from many other fields—geophysicists, chemists, civil engineers and the like—have proven most valuable in aiding in the selection of locations, while geologists regularly are consulted in connection with the drilling of the tests. It was always somewhat difficult to make a sharp distinction between petroleum geologists and petroleum engineers; indeed, in many schools their training now is almost identical. The 1917 meeting of the association heard a paper on "The Standardization of Drilling Equipment," and that was 2 years before the inception of the American Petroleum Institute, which was later to do such valuable work along those lines.

Geologists likewise were active in encouraging more and better coring to improve their knowledge of subsurface formations; they pressed the necessity of drilling straight holes, to permit more accurate structure mapping on producing horizons; water encroachment studies are made by geologists, casing problems referred to them, and even rates of penetration (drilling time) measurements are utilized for information on subsurface geology. It is not the writer's intention herewith to claim for geologists any of the credit that belongs to petroleum engineers for improved technique in drilling tests and operating wells, but the work of the geologist, starting with surface studies, inevitably became intermingled with that of the engineer as our investigations went ever deeper into the ground. Perhaps the more inclusive term of "petroleum technologist" should be applied to all workers in these allied lines of endeavor.

The Anticlinal Theory

As stated before, most petroleum geologists of 25 years ago were seeking surface indications of structural traps in accordance with the anticlinal theory, which is generally ascribed to I. C. White, who announced it in 1885, after having evolved the idea in 1883 and having found several producing fields by its application. But Hans Hofer, of Austria, had noted the tendency of oil fields in the Appalachian area to occupy anticlinal lines of folding and published his observations in 1876, which had not come to White's attention. Also, T. Sterry Hunt in Ontario in 1861 made an excellent statement to the same effect, as did E. B. Andrews in Pennsylvania a few months later. Still earlier, H. D. Rogers of Pennsylvania had suggested something of the sort in 1860, less than a year after the completion of Drake's discovery well.

For that matter the prevalence of oil seepages along the crests of anticlinal folds had been observed and reported by William Logan in Gaspe, Quebec, and by W. B. Rogers in Ohio as early as 1842. The significant thing is that these principles had not been utilized and their publication was unknown to White 40 years later when he employed them commercially with conspicuous success in West Virginia. Even so, another 30 years elapsed before the American oil industry accepted them generally, although in the meantime the Dutch had started to use them in the East Indies and the British in Mexico.

It is difficult to date with certainty the introduction of new principles or new methods in the progress of petroleum geology, and to assign accurately credit for same to the proper individuals. Such innovations as have been published in scientific papers are helpful to that end but frequently we find that 10 or 20 or even 30 years earlier similar activities had been undertaken by others, perhaps in far-distant areas, whose pioneering work was not reported. Or, something may have been contributed by one man here, another by a second man there, while still a third, with or without knowledge of the others, produces a full-fledged theory, or method, or technique, which develops into a commercially important discovery. Such researches into history are quite fascinating as a study, although rather fruitless merely to ascribe credit, and these notes are intended only to record the development and expansion of petroleum geology collateral with the growth and progress of the American Association of Petroleum Geologists.

At an earlier date than the development of the anticlinal theory (which could have been called better the "structural theory") American and Canadian geologists had given some thought to the origin of the gas and oil noted in seepages and

Known as "The Father of the Association"

CHARLES H. TAYLOR

When Charles H. Taylor, referred to as the father of the American Association of Petroleum Geologists, arrived in Oklahoma in 1909 to teach in the department of geology in the state university, there were perhaps a half-dozen geologists working in the state. By 1915 there were about 50 in Oklahoma and adjoining states, besides 50 young men specializing in geology at the University of Oklahoma. With the idea of binding these active and prospective geologists closer together professionally Mr. Taylor called a conference, with a technical program in January 1916. He wrote personally to all whom he could reach. E. L. DeGolyer and J. Elmer Thomas, already distinguished geologists, aided in the enterprise. It was voted to hold another meeting the next year in Tulsa, and there the A.A.P.G. was born.

Mr. Taylor was fresh from the University of Chicago when he took his teaching position in the University of Oklahoma. He had majored in geology and had done 3 years' graduate work in addition to field work in Wisconsin, Illinois, and Colorado. While teaching he worked during vacations with the U. S. Geological Survey and he made a study of Oklahoma granites. He also made geological reports on oil possibilities of areas in several states. He resigned his teaching post in 1916 and gave most of his time to development of the West Augusta anticline, which he had mapped and where associates had drilled for gas in 1914. Work as a consulting geologist followed.

springs, or polluting shallow water wells. In fact, ancient man, in Asia and in Europe, doubtless wondered about them long before the Christian Era. Following the Drake discovery "surface indications" played a large part in the earliest prospecting. "Creekology," trend lines, topography similar to adjacent producing areas, all played their part and brought some successes, particularly in the eastern fields. Since Spindletop occupied a low mound on the flat Texas coastal plain, many other such mounds were tested and some fields found. When the occurrence of oil was recognized to be generally in porous, sedimentary rocks on anticlines, attention was given by I. C. White and others to the questions of gravitational assortment of oil, gas, and water in those traps. Early in the present century further studies were made by M. J. Munn, W. T. Griswold, C. W. Washburne and others, on the problem of movement of liquids in natural reservoirs, including flushing by meteoric and connate waters, as additional geologic information and oil-field data became available.

Surface Mapping

The earliest methods employed—hunting seepages, mapping dips and strikes by clinometers or hand levels, surveying by pocket compasses and pacing tallies, and establishing approximate elevations with aneroid barometers—were just giving way a quarter century ago to more precise surveying with plane tables and alidades, which developed surface structure contour maps wherever outcrops afforded sufficient evidence. In 1920 there were 543 members enrolled and the territory then considered as most likely to prove oil-bearing was being examined very carefully. By 1925 membership rolls had increased to 1,235 and that 5-year period, 1920-25, marked the zenith of success in discovering oil fields by surface studies.

This is not to say that surface mapping has become unimportant since then, although it is now far less fruitful. Discoveries in newer petroliferous provinces periodically expanded the area to be studied, such as Mississippi last year, the Illinois basin 3 years ago. Also some areas are remapped again and again; a certain county in South Texas is now being detailed for the fifth time by the same company. The geology presumably has not changed and the field evidence remains the same, but the capability and comprehension of geologists may have improved.

The introduction of airplane photographs, used as an accurate base map and also as a perfect record of surficial appearances, came in 1920 but their use did not become general until 1930 or later. They represented an even greater advance over plane-table mapping than the latter was over primitive dip-and-strike readings. Today's geologists take these excellent pictures, carefully printed to scales of various convenient sizes, into the field with them and plot surface data directly thereon. Supersensitive films record differences in color and texture and moisture of soils, changes in vegetation, etc., that are hardly apparent to the eye of a man on the ground, and these airplane photographs thus have earned the credit for several successful discoveries.

Paleontology

From the outset, fossils collected from outcropping rocks were studied to determine the age of the formations and to assist in correlating the various beds. It was but a short step to undertake the examination of well cuttings (principally by cable tools at first) for similar identification of underground strata. By 1919 micropaleontology was launched and by 1922 most of the companies were employing specialists for that work. This aided in giving our work a "third dimension."

More careful collecting of well samples and more detailed examination of them added micropetrography to the repertory since it was recognized that the absence or presence and amount of certain heavy minerals in the sediments afforded another useful means of correlating formations, sometimes over considerable distances. Paleontologists and petrographers occupied with oil exploration were admitted to membership in the association and in 1927 formed their own society, which affiliated and hold concurrent meetings with the larger body. Each year the Society of Economic Paleontologists and Mineralogists holds some separate sessions and some joint sessions with the parent association.

Subsurface Mapping

Test pitting and trenching, where surface evidence is meager, was borrowed from the more venerable mining industry and was a first step towards subsurface geology, although the earliest efforts to identify producing horizons caused the preparation of correlation charts in 1915 and from them the first subsurface contour maps were prepared as early as 1916 in Oklahoma. This work has progressed and improved and promises to retain its importance in exploratory work, since each new well drilled affords additional data to be studied.

Core drilling was suggested in 1917 by George E. Burton and was started in the Mid-Continent area by Van der Gracht about 1919, and for the next several years was used quite extensively in areas where paucity of recognizable surface data gave little structural evidence, but underlying beds at depths of only a few hundred feet gave information sufficient for structural contouring. Core drilling to penetrate ore bodies had been an established practice in mineral exploration but petroleum geologists were the first to apply it simply for subsurface data.

Not only was core drilling and subsurface study desirable and necessary for underground correlations and structure mapping in areas where surface outcrops were insufficient, but it soon came to be realized that changes in the thickness of formations, angular unconformities and disconformities, sometimes made the subsurface structure quite different from that disclosed at the surface above. Buried hills quite without any surface reflection of structure were found to form traps suitable for the accumulation of oil.

Erosional unconformities, shore lines and other stratigraphic traps, were recognized as of immense importance. In 1925 the majority of the association's membership (1,253) probably were devoting more of their time to subsurface than to surface investigations and that tendency has increased ever since. By 1928 the membership reached 1,952 and by 1931, with a large number of geophysicists enrolled, it reached 2,562.

Drilling technique also was scoring notable advances and the increasing number of progressively deeper tests to be studied supplied the geologists with more and better data to be analyzed. A drilling bit is the final discoverer of any oil field, but every hole drilled affords information of value to geologists. Improved core barrels, sidewall samples, drill-stem testers and bottom-hole samplers have been most helpful in increasing the effectiveness of subsurface determinations. Well-hole surveys, the orientation of cores, thermal studies, core analyses, water analyses, all played their part. Then came the electrical log.

Electrical Well Logging

First developed by Schlumberger in 1928, these devices for measuring the porosity and resistivity of the formations which the drill has penetrated were introduced into this country about 5 years later. The Russians had adopted their use much earlier, having run 800 of them in 1930 and published the results. The electrical logs probably represent the greatest advance in exploratory work during the past decade. In some cases they afford more and better information on the formations than the cores themselves. They are utilized extensively, and in some areas almost exclusively, for making subsurface correlations. Togrether with paleontology and the microscopic examinations of well cuttings, subsurface correlations—even at depths of 10,000 to 12,000 ft.—have become so precise that many small but im-

Served as Secretary-Treasurer, 1919-1926

Dr. Charles E. Decker, who served as secretary-treasurer of the American Association of Petroleum Geologists from 1919 to 1925, inclusive, had joined the geological faculty of the University of Oklahoma in 1916, coming from Allegheny College, Meadville, Pa., where he had been associate professor of biology and geology. He became professor of paleontology in 1925. He was deeply interested in the work of the new association when chosen secretary and during his 7 years of service in that post saw its membership grow from 391 to 1,504. In recognition of his work he was named an honorary member in 1927.

He graduated at Northwestern University in 1906, with the degree of A.B. From the University of Chicago he earned his A.M. degree in 1908 and his Ph.D. in 1917. He is a fellow of the American Association for the Advancement of Science and of the Geological Society of America, and is a member of the Paleontological Society of America. He was president of the Society of Economic Paleontologists and Mineralogists, 1931-1932. He is a Fellow of the Oklahoma Academy of Science and was president in 1934 and 1935. He is also a member of the Committee of the National Research Council, appointed to study the Silurian of Oklahoma and adjacent areas as a part of the general study of the Silurian of North America.

Dr. Decker is the author of a large number of geological publications.

CHARLES E. DECKER

portant faults have been found which otherwise would be unrecognizable. Electrical well records are also helpful in detecting pay horizons unnoticed in rotary drilling and assist notably in the completion of the wells.

Geophysics

The preceding decade had witnessed the introduction of geophysical surveys and this event may safely be considered the outstanding development in oil exploration during the past quarter century. It is quite possible that had not these geophysical surveys been introduced in the twenties, our country would be very short of oil today, with substantial imports required to meet the demand even at much higher price levels. The tremendous importance of geophysical work well may be emphasized by geologists, who needed it so badly and use it so extensively, without detracting in the slightest from the credit due the geophysicists who developed, operated and perfected the several techniques.

It was the U. S. Coast and Geodetic Survey, acting upon the request of David White, of the U. S. Geological Survey, who first made gravity determinations with pendulums in this country, taking some readings in Texas and Maryland, during 1917-19. The torsion balance had been designed by Baron Eotvos in Hungary about 1890, but it was not applied by petroleum geologists (Dutch and English) until 1920. The first oil exploration in this country by this means was in Texas in 1922 by Barton under the direction of DeGolyer. The first salt dome (Nash) was found by this method in 1924, and it was proven productive in 1926. This is believed to be the first oil discovered by geophysical surveys in the United States, perhaps in the entire world.

Dozens of field parties took up this new method, particularly along the Gulf Coast, but also in the Permian basin and elsewhere, and for several years the torsion balance enjoyed quite a vogue, especially in the salt-dome territory, until it was gradually supplanted by other methods. In recent years the gravity meter has become popular as a quicker and cheaper means of reconnaissance.

Experimental work with seismographs had been carried on in this country even before the introduction of the torsion balance into oil-field exploration. At the Dallas meeting in 1920 J. A. Udden, then head of the Bureau of Economic Geology at the University of Texas, suggested that the seismograph might be used for detecting buried structures. Mintrop in Germany, and McCollum, Haseman, Karcher, and Eckhart in this country had been studying its possibilities ever since its wartime uses in 1917, and in 1920, in association with a group of Oklahoma geologists, including Ohern, Buttram, and Perrine, they did some field work with it in Oklahoma which was not successful. Some field work was done in Mexico with seismographs during 1921-23, and they were introduced in the Texas Gulf Coast in 1924 under the direction of Alexander Deussen, and shortly thereafter L. P. Garrett utilized this new technique most aggressively.

The refraction method first employed was very successful, especially with comparatively shallow salt domes. The reflection method, an improved technique developed by McCollum, Karcher, and others won a preference by 1930-32, is in general use now and is responsible for numerous discoveries of large importance. It is the leading exploratory method today and its use should continue to disclose favorable structures at greater and greater depths since the drillers are now able to penetrate to 15,000 ft., or even deeper. In recent years it has seemed that the rate of discovery of new prospects was declining and we may have passed the peak with this method, since most of

Milestones in Association's History

Meetings	Place—	Membership	Meeting highlight—
1916	Norman, Okla.	....	Society for petroleum geologists was proposed.
1917	Tulsa, Okla.	94	"Southwestern Association of Petroleum Geologists" was organized.
1918	Oklahoma City, Okla.	176	Name changed to "American Association of Petroleum Geologists."
1919	Dallas, Tex.	348	First 3-day meeting held.
1920	Dallas, Tex.	543	Decline of Ranger boom brought threat of oil shortage.
1921	Tulsa, Okla.	621	Committee named to make nation-wide estimate of oil reserves in connection with U. S. Geological Survey.
1922	Oklahoma City, Okla.	767	Midyear meetings authorized; first one held at Denver, Colo.
	Denver, Colo.*		
1923	Shreveport, La.	901	Large fields of southern California were in spotlight.
	Los Angeles, Calif.*		
1924	Houston, Tex.	1,080	First separate publication of a unit volume, "Salt domes" authorized.
1925	Wichita, Kans.	1,253	Pacific Coast Section established and first regional meeting held.
1926	Dallas, Tex.	1,504	Permanent headquarters office established in Tulsa; business manager selected.
	Denver and New York City*		
1927	Tulsa, Okla.	1,670	Largest meeting to that date, in attendance, by members and guests.
1928	San Francisco, Calif.	1,952	Program stressed overproduction and conservation.
1929	Fort Worth, Tex.	2,126	"Structure of Typical American Oil Fields" published in two volumes.
1930	New Orleans, La.	2,292	First foreign section chartered at Maracaibo, Venezuela.
1931	San Antonio, Tex.	2,562	Society of Petroleum Geophysicists became affiliated.
1932	Oklahoma City, Okla.	2,558	Members devoted additional attention to production methods and engineering problems.
1933	Houston, Tex.	2,336	First important slump in number of members noted.
1934	Dallas, Tex.	2,043	Relation of conservation and proration to geological work was an important topic.
1935	Wichita, Kans.	1,973	First meeting (midyear) on foreign soil, Mexico City.
	Mexico City, Mex.*		
1936	Tulsa, Okla.	2,169	Membership rolls again on increase.
1937	Los Angeles, Calif.	2,331	Geology of California was special subject.
	Pittsburgh, Pa.*		
1938	New Orleans, La.	2,646	Membership rolls established a new high.
	El Paso, Tex.*		
1939	Oklahoma City, Okla.	2,951	Four papers dealt with soil-gas analyses.
1940	Chicago, Ill.	3,246	Celebrates twenty-fifth year of activity.

*Midyear meetings.

the favorable areas now have been "shot" many times by numerous companies.

The magnetometer was introduced into oil exploration about 1924, after much earlier use in prospecting for minerals. It has been successful in locating some oil fields but not comparably to the torsion balances and seismographs. It is still used, though to a lesser extent than was the case 10 to 15 years ago. Electrical methods have also been tried, in Europe as well as in this country. The writer knows of no American oil field discovered by such methods although the Russians report some success with it. The association promptly gave space in its bulletin to geophysical papers as rapidly as they were released for publication. Many association members were occupied with geophysical studies and in 1931 the constitution was amended to grant membership to geophysicists, geochemists, and others. In 1932 a geophysical division was chartered, but it was dissolved in 1937, since its work was being carried on by the Society of Exploration Geophysicists which was organized in 1931 and became affiliated with the A.A.P.G. It has become a large and active society in itself.

Soil-Gas Analyses

All of the geophysical methods mentioned above have been used by geologists in attempting to locate stuctures favorable for the accumulation of oil. One can hope that some day a means will be devised for reading directly on oil deposits. It is possible that soil-gas analyses, on which much work has been done in the United States during the past 3 years, may prove to be such a method, but while the case for it is not yet proven in this country, it cannot be discarded as a possibility. As in the case of the geophysical methods, we progress from refinements in technique to accuracy of determinations to improvements in interpretation, all of which require time and practice.

Patents and methods of making soil-gas analyses were taken out in January 1928 by Laubmeyer in Germany, but the Russians appear to have precedence in this field. Bogoiavlenski presented a paper in 1924 on chemical analyses of soil for gas and other hydrocarbons and, while he was primarily interested in measuring alpha ray emanations as an indication of oil, he seems to have done the earliest work reported on soil-gas analyses. In this country Blau, Rosaire, McDermott, and several others did the pioneering work and soil-gas analyses on a commercial basis were inaugurated in 1937.

In addition to the analyses of gases there are methods now undergoing experimentation for testing soils for other hydrocarbon contents, bacteriological reactions and the like, some of which have been under investigation for as much as 10 years. In fact, it may well be that the avid search for "paraffin earth," sour gas and sulfates in the Gulf Coast 30 to 40 years ago was the primitive forerunner of such methods.

Estimates of Reserves

The income-tax laws of 1918 called for detailed estimates of the oil underlying producing properties in connection with depletion allowances. A paper on this subject was presented by Ralph Arnold at the 1919 Dallas meeting and for some years just after the war a large number of geologists (and auditors and lawyers) were occupied with such work. These estimates for individual properties led directly to the preparation of nation-wide estimates of our oil reserves. Since 1880 several informed guesses on that subject had been made from time to time by some able individuals, including David T. Day, George Otis Smith, and Ralph Arnold, but a detailed study of the subject was not made until 1921 when David White requested the American Association of Petroleum Geologists to cooperate with the U. S. Geological Survey on a comprehensive survey of our known reserves. A committee of association members complied and arrived at a figure of 5 billion barrels for our proven reserves, recoverable by then-current methods at then-current prices.

The public in general pays too little attention to those qualifying phrases and hence are apt to misunderstand the intent of such estimates. They have been criticized severely by some who appear not to realize that such figures are not intended to take into consideration pools which are yet to be discovered, deeper sands that may prove in the future to underly previously developed reservoirs, improved methods of recovery and the like. Present estimates are in the neighborhood of 20 billion barrels. Some critics have pointed out that each subsequent estimate has shown ever higher reserves in spite of the amount of oil produced in the meantime, and yet the geologists prefer to make additions to previous estimates as new reserves are discovered, rather than to make deductions for hopes or anticipations not realized.

In 1925 the American Petroleum Institute sponsored a very elaborate survey of reserves in which many association members assisted. Again in 1935 the Institute appointed a committee consisting of all living past presidents of the association and they, assisted by dozens of other men, prepared another detailed estimate. Such studies now are considered so valuable that many companies have separate staffs of specialists who devote their entire time to estimating reserves and making valuation appraisals. A committee of such men prepare a joint estimate of reserves, revised annually, for the American Petroleum Institute, which publishes their findings.

A new use for valuation appraisals has grown up with proration in the past 5 to 10 years. The curtailed output from large wells has postponed the recovery of development costs for a period of years and frequently loans are made by banks and insurance companies on such producing properties, usually when careful appraisals and estimates of ultimate recovery support the assurance of safe loans. This work receives the attention of many geologists today.

Proration Problems

Proration problems, legal, political and economic, likewise have diversified the duties of geologists in recent years. The desirability of balancing supply with demand, the advantage to conservation principles of a controlled surplus which permits restraining wells to their optimum rates of flow, and the necessity of working out an equitable basis for withdrawals from properties within a single pool and as between all other pools, have required the attention of other groups of specialists within the ranks of the geologists. The attitude of the industry, public opinion, the existing laws and the orders of regulatory bodies, all change from time to time and require constant study. Marked advances on this subject likewise have been made in the past decade and further improvement is to be expected.

Some hardier souls have even suggested that studies should be made of our proven reserves with reference to our current consuming requirements, presumably with a view towards maintaining some sort of a functional relationship, but the writer is not among that group. In his opinion not even the rigid regimentation of a fascist economy could work out such a theoretically desirable result. Even an all-wise, all-powerful, benevolent dictator would not know when an exceptionally favorable "shooting picture" is going to prove barren or when a blind wildcat in hitherto unproductive territory is going to point the way to 5 billion barrels.

Study Groups

A highly important event in the last few years has been the inauguration of local study groups in which members particularly interested in specific problems voluntarily form small groups for intensive work on those subjects. The earliest instance of this may have been in Wichita, Kans., 4 or 5 years ago. Such work was begun in Houston, Tex., 2 years ago and soon was taken up by

J. P. D. HULL

Capable, Alert Business Manager

When accused of having done some particularly praiseworthy work, J. P. D. Hull, business manager of the American Association of Petroleum Geologists usually remarks that he "was just around when it happened." On leaving John Hopkins University with his A.M. in 1917, Mr. Hull became assistant state geologist of Georgia. In 1920 he began work with Louisiana Oil Refining Corp. in Arkansas and was present at the completion of the state's first oil well at Stephens and the state's first gas well at El Dorado. This propensity for being around may have been a factor in his promotion to chief geologist for his company in 1926. Then he resigned to become business manager of the A.A.P.G.

Since that time the association has become the world's largest and most active geological society. Its bulletin is a model among scientific publications and Mr. Hull has been very much around. Under his direction routine association and editorial matters move like clockwork. Association members always find a cordial welcome at their headquarters, where many a student looking for employment has found a friendly counsellor and an energetic helper.

Yet, when bouquets are being passed out, Mr. Hull breaks his habit and is rarely around. He is too busy looking after the association's business to find time to receive the tributes his energy, capability and friendliness deserve.

Mr. Hull was born in Highland, N. Y., August 10, 1889. He attended Hamilton College, from which he graduated in 1913. On graduation, he was awarded an Elihu Root fellowship. His early geological experience was gained on the New York Geological Survey and the Maryland Geological Survey.

Current Officers of American Association of Petroleum Geologists

HENRY A. LEY
President

L. MURRAY NEUMANN
Vice President

ED. W. OWEN
Secretary-Treasurer

W. A. VER WIEBE
Editor

geologists in San Antonio and other oil centers. Something of the sort on a more widespread scale is being organized by A. I. Levorsen, of Tulsa.

This carries us back to one of the prime factors which led to the founding of the association in 1915-17, since when the organization has become so large as to be somewhat cumbersome. Very large benefits undoubtedly will be derived from the work of these study groups. Their work will emphasize certain of the more important questions demanding careful attention, will lead to the presentation of numerous papers at the weekly and monthly meetings of the various local geological societies, will stimulate discussion on the part of a larger number than those in the study groups themselves, and will accelerate the preparation of papers for the association's annual meetings and subsequent publication in the bulletins.

Another important function of the work fostered by local geological societies is their annual or semiannual field trips. Carefully arranged, with road maps logged in advance, these are planned to take the members on 1 or 2-day trips, sometimes longer, to inspect and discuss important geological outcrops. Usually guide books are prepared which provide a most complete compilation of all pertinent information on the geology and oil developments of a large area, fully illustrated with elaborate areal maps, geological cross-sections and graphic well logs. These trips are frequently joined by geologists from many other parts of the country and the guide books form valuable compendiums of important information.

Public Educational Work

Bringing geology to the layman, informing the general public of the nature of the work done by petroleum geologists and its importance in their daily lives, lagged behind the growth and expansion of the profession and activities of its members in educating themselves in the newest developments. In 1932 F. H. Lahee took the lead in remedying that situation, and since then an active group of members in all parts of the country has functioned as the Committee on Applications of Geology.

Papers on petroleum geology of general interest to the public have been written for the Scientific Monthly, the National Better Business Bureau, newspapers, trade journals, and numerous other publications. Elaborate scientific exhibits have been prepared for international expositions, state fairs, and many other gatherings where scientific matters presented in a popular form could be explained to a large number of people. Such exhibits include maps, cross-sections, charts, instruments, samples of rocks, minerals, crude and refined oils, and even miniature working models of oil fields and refineries.

Members of the association have volunteered to deliver lectures at colleges and universities, high schools, night classes, Y.M.C.A. groups, Boy Scout associations, and various other assemblies such as chambers of commerce, business men's luncheon clubs and the like. In some cases formal courses of study have been prepared. Radio talks also have been arranged on subjects of general public interest and several elaborate educational movies have been made, some with sound tracks. Though tardy in inaugurating these activities, geologists today are recognizing and discharging their civic responsibilities.

Changes in Geologic Theory

A large volume, and a most interesting one, could be written on the subject of changes in our theories and hypotheses in petroleum geology during the past quarter century. The science is less than 100 years old, most of the progress has been made in the last 25 years and much of it in the last 15 years. It will suffice here to mention only a few highlights in that record.

Early observations that oil and gas occurred in sedimentary rocks on anticlinal folds have been mentioned, and also the early views on gravitational assortment in those reservoirs as well as the movement of fluids, including flushing by meteoric and connate waters. In the earliest days the causes of folding, the forces that produced the traps, were generally ascribed to compressive stresses, perhaps due to the uplift of major mountain ranges or shrinking in the earth's crust.

Soon it was realized that uplifts or lateral pressures were inadequate to explain numerous comparatively small folds, and the settling, or compaction, theory was born. Powers and others pointed out that differential settling over buried hills or even over sand lenses seemed sufficient to produce arching in the overlying rocks. Also some folds found now at depths of 10,000-12,000 ft. appear to have been formed in early times and the overlying beds show no evidence of folding at depths of as much as 8,000 ft. in some cases. F. W. DeWolf called attention to the frequency of oil accumulations related to unconformities and the search for disconformities and stratigraphic traps increased. This latter type of reservoir offers large prospects for future work and many companies are diverting geologists recently concerned with following up geophysical determinations to broad stratigraphic studies of regional geology. This recalls A. W. McCoy's pioneer work in 1919-21 and a paper by Luther H. White in 1926.

Some university faculties have emphasized that the petroleum geologists, by concentrated and competitive work, have mapped the structure of oil-field areas more thoroughly than any other part of the earth's surface, and extremely detailed studies, both surface and subsurface, in sedimentation also have led to very important results.

The writer recalls, for instance, comments by Prof. R. D. Salisbury in university classrooms 30 years ago, inviting attention to the peculiar nature of Permian formations all over the world and the geological problems they presented. When the petroleum geologists in Oklahoma carried their surveys westward into the "red beds" areas 20 to 25 years ago, Professor Salisbury expressed the hope that the petroleum geologists, with their highly intensive investigations, would find the solution to those problems. Since then an enormous amount of data has been gathered, especially in the Permian basin of West Texas and Southeast New Mexico. Preparation is under way for a special volume of reports confined to the geology of the Permian.

Investigating changes in facies of sedimentation led to the recognition of limestone reefs in the Permian basin, as first described by E. Russell Lloyd, Lon D. Cartright and others in the late twenties or early thirties. Following the publication of discussions on this subject, the geologists of Russia, whose oil industry antedates ours in America, inaugurated search for similar phenomena and met with some successes. Careful investigation of various sedimentary changes may bring additional discoveries in the future, particularly in locating shore lines and other stratigraphic traps.

A good statement of the carbon ratio theory was made by Henry D. Rogers in 1863 but it was not until David White emphasized it and applied it some 50 years later that petroleum geologists gave very much attention to the percentage of fixed carbon in the rocks of an area as an index

(Continued on Page 40)

GALLERY OF PRESIDENTS

J. ELMER THOMAS
1917

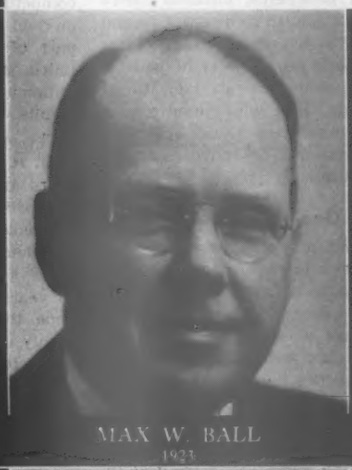
ALEXANDER DEUSSEN
1918

I. C. WHITE
1919 (deceased)

W. E. PRATT
1920

G. C. MATSON
1921 (deceased)

W. E. WRATHER
1922

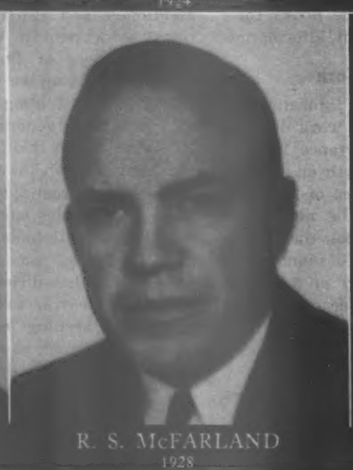

MAX W. BALL
1923

J. H. GARDNER
1924

E. DEGOLYER
1925

ALEXANDER W. McCOY
1926

G. C. GESTER
1927


R. S. McFARLAND
1928

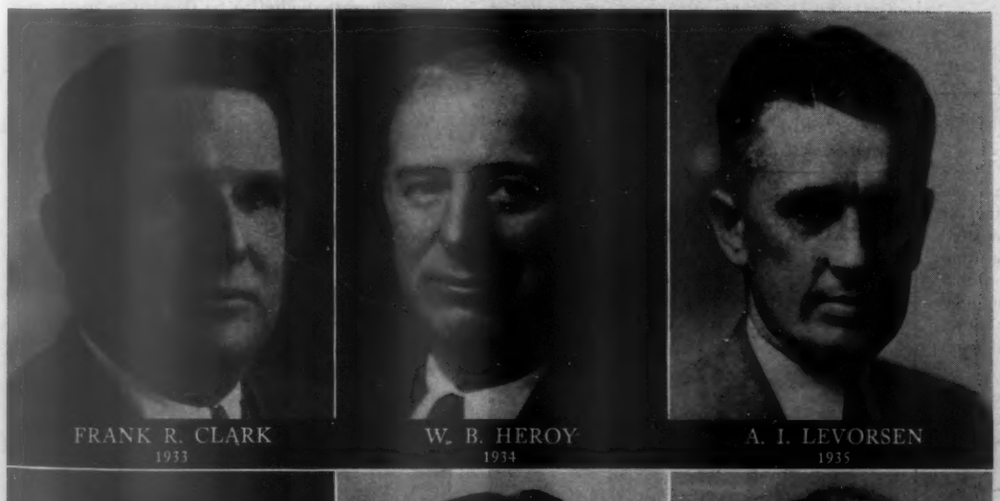
J. Y. SNYDER
1929 (deceased)

SIDNEY POWERS
1930 (deceased)

L. P. GARRETT
1931

F. H. LAHEE
1932

A.A.P.G. PAST 1917–1939



FRANK R. CLARK
1933

W. B. HEROY
1934

A. I. LEVORSEN
1935

RALPH D. REED
1936 (deceased)

H. B. FUQUA
1937

D. C. BARTON
1938 (deceased)

Other Officers of the A.A.P.G.

Since Its Founding

IN addition to the past presidents of the association, other officers who have served since the birth of the organization are listed below:

1917
Alexander Deussen, vice president
M. G. Mehl, secretary-treasurer
C. H. Taylor, editor

1918
I. C. White, vice president
W. E. Wrather, secretary-treasurer
C. H. Taylor, editor

1919
Irving Perrine, vice president
C. E. Decker, secretary-treasurer
C. H. Taylor, editor

1920
Alexander W. McCoy, vice president
C. E. Decker, secretary-treasurer
R. C. Moore, editor

1921
G. C. Chester, vice president
C. E. Decker, secretary-treasurer
R. C. Moore, editor

1922
Max W. Ball, vice president
C. E. Decker, secretary-treasurer
R. C. Moore, editor

1923
F. W. DeWolf, vice president
C. E. Decker, secretary-treasurer
R. C. Moore, editor

1924
E. C. Gaylord, vice president
C. E. Decker, secretary-treasurer
R. C. Moore, editor

1925
R. S. McFarland, vice president
C. E. Decker, secretary-treasurer
R. C. Moore, editor

1926
C. R. McCollom, vice president
Fritz L. Aurin, secretary-treasurer
J. L. Rich, editor

1927
Luther H. White, vice president
David Donoghue, secretary-treasurer
J. L. Rich, editor

1928
J. E. Elliott, vice president
David Donoghue, secretary-treasurer
J. L. Rich, editor

1929
Fred H. Kay, vice president
A. R. Denison, secretary-treasurer
F. H. Lahee, editor

1930
Ralph D. Reed, vice president
Marvin Lee, secretary-treasurer
F. H. Lahee, editor

1931
L. C. Decius, vice president
Frank R. Clark, secretary-treasurer
F. H. Lahee, editor

1932
R. J. Riggs, vice president
W. B. Heroy, secretary-treasurer
R. D. Reed, editor

1933
George Sawtelle, vice president
W. B. Heroy, secretary-treasurer
L. C. Snider, editor

1934
E. B. Hopkins, vice president
M. G. Cheney, secretary-treasurer
L. C. Snider, editor

1935
F. A. Morgan, vice president
E. C. Moncrief, secretary-treasurer
L. C. Snider, editor

1936
C. E. Dobbin, vice president
Charles H. Row, secretary-treasurer
L. C. Snider, editor

1937
C. L. Moody, vice president
Ira H. Cram, secretary-treasurer
W. A. Ver Wiebe, editor

1938
H. W. Hoots, vice president
Ira H. Cram, secretary-treasurer
W. A. Ver Wiebe, editor

His Contributions to Literature Are Valuable

Scientist, scholar, and practical oil geologist, Dr. L. C. Snider has made valuable contributions to the literature of geology. For 4 years, beginning in 1933, he was editor of the Bulletin of the American Association of Petroleum Geologists. In the association's outstanding publication, "Problems of Petroleum Geology," Dr. Snider wrote the forword on the origin and evolution of oil and an article on source beds for petroleum. His "Earth History" is an authoritative volume. More recently, he has turned his attention to the methods of alleviating possible oil shortage. During his term of office, the association published 7 of its 13 volumes of special publications.

On obtaining his master's degree from Indiana University in 1909, Dr. Snider served as chemist, field geologist, and assistant director of the Oklahoma Geological Survey until 1915. In that year he received his doctorate from the University of Chicago. Successively he worked as geologist for Pierce Oil Corp., Cosden Oil & Gas Co., and Empire Gas & Fuel Co. In 1925 he went to New York, where he since has been consulting geologist for the Cities Service interests.

Dr. Snider is a member of the Council of the Society of Economic Geologists, of the editorial board of the Geological Society of America; of the papers and publications committee of the A.I.M.E., and of the advisory committee on fundamental research on the occurrence and recovery of petroleum of the A.P.I.

DR. L. C. SNIDER

A. A. P. G.'s Growth Parallels Geological Expansion

(Continued from Page 37)

to its probable potentiality for oil and gas production.

Close attention has been paid to connate water since the early twenties and more data are obtained each year on that subject. The names of McCoy, Brace, Schiltuis and others are associated prominently with such studies. The recognition that much of the connate water originally occupying the pore space in sand reservoirs remained there after oil incursions has modified our views of the ultimate recovery of oil as computed from porosity determinations.

In 1926 Heroy proposed the use of the term "reservoir pressure" as distinguished from "rock pressure" and petroleum geologists and petroleum engineers began to pay increased attention to actual underground conditions in oil and gas reservoirs. The invention of depth-pressure gages and bottom-hole samplers has facilitated this study as have the data obtained from electrical well logs. Many such advances in geologic thought had to await the invention by engineers of devices capable of obtaining more and better data from wells drilling to propressively greater depths. The depths at which we are now prospecting, and making discoveries, has directed attention again to the question on the probability of locating additional oil reserves at such great depths. It may soon be possible to drill wells to 20,000 ft. and to make geophysical exploration for structural evidence at 30,000 ft., but we cannot know at present that crude oil as such exists under the conditions of pressure and temperature that must obtain at such depths.

A very recent concept cited by Wallace E. Pratt (personal communication to this writer) concerns the likelihood that some features of the most modern refining technique may have been accomplished in the past by mother nature underground. Such physical and chemical changes as are involved in distillation, cracking, hydrogenation, polymerization, methanation, and retrograde condensation, may quite well have taken place under natural conditions in deeply buried reservoirs. Long time and high pressures, even without extraordinarily high temperatures, may have brought about great changes in the character and constituents of the complex combinations of hydrocarbons which are our oil, gas, and distillates.

These considerations are of growing importance as our exploration for oil reserves goes ever deeper into the earth. Is there a critical level below which we will not find crude oil on certain types of structure in some parts of this country? And have we perhaps penetrated it already in some sections of the Texas-Louisiana Gulf Coast or in California? In any event the concept mentioned above may permit a simplification of our theories of a quarter-century ago on origin and migration of oil and gas. It may be no longer necessary to postulate the formation of crude oil as a liquid in source beds, such as shales, and its subsequent movement into adjacent sandstones or other porous reservoirs through capillary attraction or by gravitational assortment, or by working its way up the dip of inclined beds until caught in an effective trap. At least the possibility presents itself that gaseous hydrocarbons may have been distilled naturally from solid-source materials and may have migrated freely as a gas until confined in closed structures in which liquefaction has taken place subsequently.

Conclusion

This narative must be terminated but the story is not yet ended. Here is a well-organized group, national and international, of more than 3,200 men occupied with some phase of oil exploration, production, and research, which maintains a suitable headquarters office and efficient business staff. With it two other large national societies of allied technicians are affiliated. Also closely connected therewith are three regional sections and 21 local geological societies with two additional ones being organized now. The mass attack of this army of investigators is bound to be fruitful in maintaining this age of petroleum as long as that is humanly possible. The outlook is for continued improvement and further progress towards perfection; truth is ever to be sought even if never to be fully attained.

Active in Association Activities

R. E. RETTGER
Chairman, Publication Committee

J. G. BARTRAM
Chairman, Geological Names and Colleration Committee

M. G. CHENEY
Leader, Origins and Evolution of Oil Group

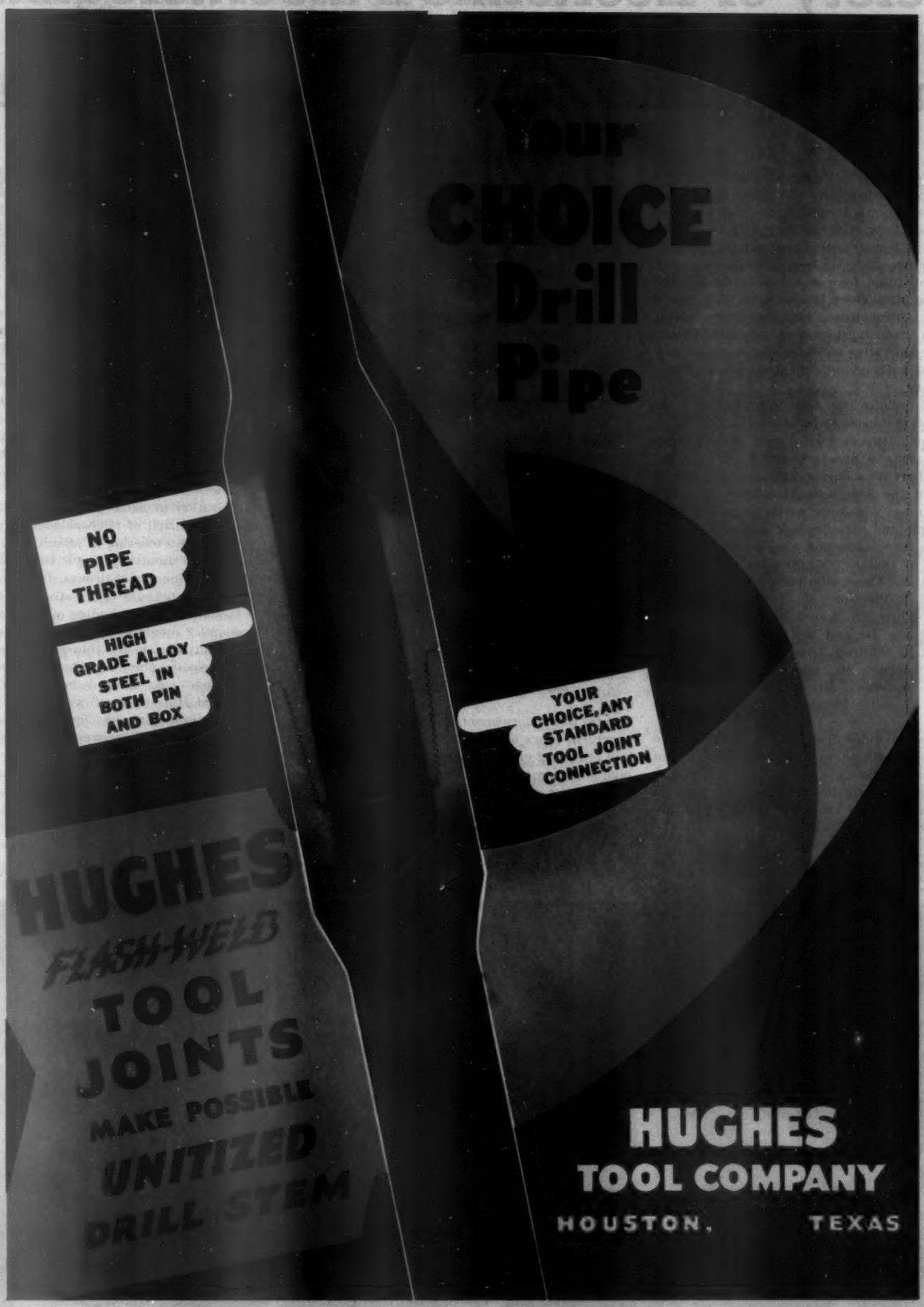
E. W. GALLIHER
Leader, Sedimentation and Reservoir Rock Group

N. W. BASS, Leader, Relation Oil Analyses to Stratigraphy Group

M. M. LEIGHTON
Leader, Field Trips

VERNER JONES
General Chairman, 25th Annual Meeting

D. L. CARROLL
Chairman, Publication Committee


Your
CHOICE
Drill
Pipe
NO
PIPE
THREAD
HIGH
GRADE ALLOY
STEEL IN
BOTH PIN
AND BOX
YOUR
CHOICE, ANY
STANDARD
TOOL JOINT
CONNECTION
HUGHES
FLASH-WELD
TOOL
JOINTS
MAKE POSSIBLE
UNITIZED
DRILL STEM
HUGHES
TOOL COMPANY
HOUSTON, TEXAS

Society of Economic Paleontologists And Mineralogists Firmly Established

By RAYMOND C. MOORE

NOW in its fourteenth year, the Society of Economic Paleontologists and Mineralogists has reason to feel that it is very firmly established as an important division of the American Association of Petroleum Geologists that has contributed much to scientific knowledge to the advancement of successful exploration for commercially valuable oil and gas deposits. There has been a steady record of worthy achievement, and added years merely extend an already imposing accomplishment. Ideas and cooperative endeavor that are not measured in time units underlie the development of the organization.

The first definite step toward initiation of the organization that came to be known as the Society of Economic Paleontologists and Mineralogists was the making of arrangements by F. B. Plummer and others for a dinner meeting of a group of members of the American Association of Petroleum Geologists who were specially interested in paleontologic and stratigraphic research. These individuals were attending the meetings of the association at Dallas, Tex., during the latter part of March 1926. Those who participated were Mr. and Mrs. F. B. Plummer, Dr. Raymond C. Moore, Dr. David White, Dr. Lloyd W. Stephenson, Dr. Henry V. Howe, Dr. and Mrs. W. M. Winton. Mr. and Mrs. F. L. Whitney, Miss Grace Newman, Dr. Charles Schuchert, Mr. and Mrs. Paul Applin, Prof. J. J. Galloway, Dr. and Mrs. Charles E. Decker, Prof. Julius Henderson, and Prof. E. B. Branson.

There was extended discussion of the project to organize a separate group comprising members of the association who were particularly engaged in paleontologic investigations, those who were at work in the study of the mineralogical and lithological character of oil-well samples, and all who had active interest in problems of stratigraphic nature, especially subsurface stratigraphy. It was

Raymond C. Moore, one of the founders of the S.E.P.M., and former president of the society

natural that enlargement of the association during nearly 10 years of growth should result in a certain crowding of the program at the annual meetings and in a tendency toward differentiation of departments of scientific work. The group concluded unanimously that advantages appeared in the proposal to organize a society devoted primarily to paleontologic studies and that meetings of a paleontologic society should be held in conjunction with those of the American Association of Petroleum Geologists. It was the tentative conclusion also that membership in the proposed society should be restricted to those holding full or associated membership in the American Association of Petroleum Geologists.

Finally, an organization committee was formed for the purpose of drawing up a suggested constitution and bylaws that might be offered for consideration of a larger group called together at the time of the next annual meeting of the A.A.P.G. This committee consisted of F. B. Plummer, Fort Worth, chairman; Mrs. Paul Applin, Fort Worth; Donald D. Hughes, Los Angeles; Raymond C. Moore, Lawrence; and F. L. Whitney, Austin.

The organizing committee communicated with the executive committee of the A.A.P.G., and the officers of the association gave general approval to the move to form a paleontological society and authorization to make plans for publication of a quarterly journal of micropaleontology.

At the Tulsa meeting in March, 1927, Dr. Henry V. Howe, of Louisiana State University, was selected as temporary chairman. It was the majority opinion that because of the direct relationship to the economic aims of finding oil and gas, the word "Economic" should be incorporated in the society's name, and because the mineralogic aspect of the study of sedimentary rocks as well as the paleontologic one was deemed important, "Paleontologists and Mineralogists" were added. A publication to be known as the "Journal of Paleontology" was authorized. There were 80 charter members. Officers elected were J. J. Galloway, New York, president; Donald D. Hughes, Los Angeles, vice president; Marcus A. Hanna, Houston, secretary-treasurer; and Joseph A. Cushman, Sharon, Mass., editor. The society's birthday was March 25, 1937.

A section of the society was established at Fort

(Continued on Page 59)

GAYLE SCOTT
President, S.E.P.M.

STANLEY G. WISSLER
Past President, S.E.P.M.

DR. H. B. STENZEL
Secretary-Treasurer, S.E.P.M.

Society of Exploration Geophysicists Celebrate Tenth Anniversary

By W. T. BORN
Vice President, Society of Exploration Geophysicists

THIS year marks the tenth anniversary of the Society of Exploration Geophysicists. On May 20, 1930, at the call of Dr. E. E. Rosaire, John F. Weinzierl and the late Dr. D. C. Barton, 39 interested persons met at the University Club, Houston, Tex., to discuss the organization of a society to be composed of geophysicists engaged in the exploration for oil. An organization was agreed upon, a constitution was adopted, and the new society was christened the Society of Petroleum Geophysicists. The following officers were elected: Donald E. Barton, president; E. E. Rosaire, vice president, and John F. Weinzierl, secretary-treasurer. On July 16, 1930, a published list showed 39 members active in the society.

The first annual meeting of the new organization was held at San Antonio, Tex., in March 1931, concurrently with a meeting of the American Association of Petroleum Geologists. A number of important papers were presented at this meeting. Since the new society had no regular publication of its own, these papers were originally published in the bulletin of the American Association of Petroleum Geologists, November and December, 1931, and were later reprinted by that organization as Volume I of the "Transactions of the Society of Exploration Geophysicists."

In December 1931 a meeting of the new society was held jointly with a meeting of the American Physical Society in New Orleans at which time a number of papers primarily nongeological interest were given. These papers were originally published in the journal "Physics" in March 1932 and were later reprinted as Volume II of the "Transactions of the Society of Exploration Geophysicists."

From its inception, the Society of Petroleum Geophysicists maintained a close relationship to the older body of the American Association of Petroleum Geologists. In 1932 it became affiliated with that organization as its Technical Division of Geophysics and retained that status until 1937. During that period the bulletin of the A.A.P.G. furnished a medium for publishing papers given before the various meetings of the society, and most of these papers were reprinted as Volumes III-V of the "Transactions of the Society of Petroleum Geophysicists." In addition, there appeared in 1935 a single number of a journal entitled the "Journal of the Society of Petroleum Geophysicists."

Membership Expands Rapidly

By 1936, the membership of the new society had grown to a total of 233, and with the increase of membership there arose a number of problems. The techniques developed by the geophysicists in the search for oil led to an increase in the number of technical papers submitted to the society for publication. Many of these were not of particular interest to geologists and so were hardly suitable for publication in the A.A.P.G. bulletin. At the same time, geophysical methods had become of increasing importance in other fields of prospecting, and it therefore seemed advisable to broaden the scope of the society to include other fields of exploration in addition to that of exploration for oil. To meet these conditions the society in 1936 changed its name to the Society of Exploration Geophysicists and made application to the American Association of Petroleum Geologists that the Technical Division of Geophysics be dissolved and that the status of the Society of Exploration Geophysicists become that of an independent body affiliated with the A.A.P.G. This application was favorably acted upon by the A.A.P.G. at its annual meeting in March 1937.

In 1936, the society established as its official journal a new publication entitled "Geophysics: A Journal of General and Applied Geophysics." The first number of the new publication appeared in January 1936 and has been continued as a quarterly since that time.

In 1937 the society was incorporated as a nonprofit organization under the laws of the State of Colorado.

The society has continued its close and friendly relations with the American Association of Petroleum Geologists.

The growth of the society has more than kept pace with the increasing use of geophysical exploration methods. The membership has increased from the original figure of 39 in 1930 to a total of 821 in 1940, of which total 632 are active members, 185 are associate members, and 4 are honorary members. The honorary members at the present time are as follows: E. DeGolyer, L. Mintrop, L. P. Garrett, and Wallace E. Pratt. These men have been elected to honorary membership in recognition of their work in introducing and furthering the use of geophysical methods in exploration.

The growth of the society is a tribute to the efforts of the group of men who, during the past 10 years, have served as its officers. It is impossible in this brief review to mention the accomplishments of each successive group of officers who have contributed their time and enthusiasm to the furtherance of the aims of the society. The problems of a new organization are many and varied and each succeeding administration has contributed to their solution. The society is greatly indebted to the following men who have served as president of the society during the past 10 years:

Donald C. Barton, deceased, 1930-1932; Paul Weaver, 1932-1933; Eugene MacDermott, 1933-1934; E. E. Rosaire, 1934-1935; B. B. Weatherby, 1935-1936; L. W. Blau, 1936-1937; J. C. Karcher, 1937, 1938; F. M. Kannenstine, 1938-1939; E. A. Eckhardt, 1939-1940.

In the decade now ending, the Society of Exploration Geophysicists has become the largest organized body of geophysicists in the world; and its official journal is becoming recognized as the authorative publication in the field of exploratory geophysics. With the increasing application of geophysical methods in foreign countries, there has come a world-wide distribution of the society's membership, and a corresponding broadening of its influence. The society feels its responsibility both to its members, and to the exploratory branches of the petroleum and other industries. In the years ahead, it will continue to serve as an effective means of furthering the art of geophysical prospecting and of maintaining a high professional standard among those engaging in that work.

E. A. ECKHARDT
President of S.E.G.

W. T. BORN
Vice President, S.E.G.

JOHN H. CROWELL
Secretary-Treasurer, S.E.G.

DR. F. M. KANNENSTINE
Past President, S.E.G.

R. D. WYCKOFF
Editor, S.E.G.

Analyses Present Evidence on Origin of Petroleum

By W. V. HOWARD

A RESEARCH subcommittee of the American Association of Petroleum Geologists has announced its preliminary findings before the Kansas Geological Society after 4 years of investigation of the relationship of crude oil to stratigraphy. The committee is composed of four geologists: L. Murray Neumann, chairman, Carter Oil Co.; T. F. Newman, Stanolind Oil & Gas Co.; Charles Ryniker, Gulf Oil Corp., and N. W. Bass, U. S. Geological Survey, all of Tulsa—and three chemists—Harold M. Smith, U. S. Bureau of Mines, Bartlesville, and Roy L. Ginter, consulting chemist, and S. F. Mauney, Carter Oil Co., both of Tulsa.

The committee is basing its work on analyses made by the Hempel method which has been used by the Bureau of Mines for more than 20 years. Each fraction obtained within a 25° boiling range contains a number of hydrocarbons and the committee's indices throw considerable light on the types of oil present in each fraction without the necessity of undertaking expensive and tedious separations into individual components.

The hydrocarbons occurring in oil belong to three main classes, the straight chain and the iso- or branched-chain paraffins, the naphthene hydrocarbons and the aromatic hydrocarbons associated with the benzene series. Both of the latter types are cyclic and normally occur with straight or branched chains linked to them making them compound types.

The specific gravity of the different compounds varies in such a way that a determination of the specific gravity of each fraction of the crude plotted against the boiling point of that fraction gives an idea of the proportions of the different groups represented. By plotting the reciprocals of the boiling points as abscissae and the specific gravities as ordinates, it was found that the points representing the straight-chain paraffins lie on a straight line and that no other hydrocarbons fall to the left of that line. It was accordingly given a zero index number. A parallel line through the point represented by benzene was given a value of 100. The remaining indices fall within these limits, with a few rare exceptions which have indices higher than that of benzene.

As a rule, the iso- compounds have indices ranging from 5 to 20, the naphthenes between 25 and

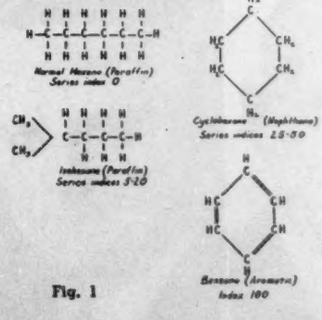


Fig. 1

50 and the aromatics between 50 and 100. (Fig. 1). The addition of chains, such as pentyl groups to the aromatics or naphthenes lowers their indices so that the index gives an idea of the "paraffinicity" or "naphthenicity" of the oil. A publication describing the development and application of this index will shortly be published by the Bureau of Mines as Technical Paper 610.

The committee has made the average of 20 analyses from the Arbuckle zone of Oklahoma City an arbitrary "normal" and compares other oils with this. As a rule, the Simpson and Wilcox oils of Oklahoma City resemble this normal very closely in all fractions, indicating a similar origin or evolution of these oils. The Wilcox oils of the other Granite Ridge pools show a marked family resemblance to the Oklahoma City Wilcox oils, but there are variations sufficient to lead to the conclusion that these oils have not all had the same history.

In sharp contrast are the Wilcox oils from the main Seminole pools which show a greatly increasing naphthenicity, resembling somewhat the Arbuckle oils of the Kansas Granite Ridge pools. The Bartlesville sand oils of the Osage and surrounding districts show considerable variation and three families have been recognized. Bartlesville oil from close to the contact with the Mississippi lime shows marked similarity with Mississippi lime oil from nearby pools.

In Oklahoma City, the Pennsylvanian oils, while rather similar generally, differ in a distinguishable degree from the Ordovician oils as well as from each other, indicating different origins or different histories. Burbank oils from the shoestring sands of Kansas show marked similarities to one another, but there are one or two exceptions to this generalization. The Wilcox oils of a group of fields including Billings, Lucien, Langston, Hoyt and West Chandler show very close similarities, indicating a common source. They are very similar to the Wilcox oils from Oklahoma City.

If this gives comfort to believers in the theory of long range migration, their opponents may derive equal satisfaction from the fact that Britton, which is only 6 miles from Oklahoma City, has a different Wilcox oil.

It is far too early to arrive at any generalizations regarding the meaning of these findings. There is no doubt but that they will provide much information of theoretical value concerning the origin and evolution of crude and it is interesting

(Continued on Page 59)

Exhibitors at A.A.P.G. Convention

AMONG the features of every convention of the American Association of Petroleum Geologists are the exhibits of new equipment, maps and laboratory materials. A number of booths have been reserved for exhibitors in the Boulevard Room of the Stevens Hotel. This room is at the north end of the building, and on the same floor as that on which the technical sessions are being held.

A list of exhibitors follows:

Booth 5—American Askania Corp., G. Stubbe, M. & M. Building, Houston, Tex. (Magnetometers, torsion balances.)

Booth 26—Atlas Powder Co., John Swenehart, advertising manager, Wilmington, Del.

Booths 19-20—E. I. du Pont de Nemours & Co., E. F. Carley, advertising manager, Wilmington, Del. (Explosives.)

Booths 3-4—Eastman Kodak Co., W. E. Barry, sales department, Rochester, N. Y.

Booths 17-18—George E. Failing Supply Co., Enid, Okla. (Portable rigs.)

Booth 27—Geochemical Service Corp., John W. Merritt, president, 321 South Detroit Avenue, Tulsa.

Booths 12-13-14—Geophysical Service, Inc., J. E. Jonsson, 1311 Republic Bank Building, Dallas, Tex.

Booth 10—Gravimetric Survey, C. H. Frost, 701 Kennedy Building, Tulsa.

Booth 16—Halliburton Oil Well Cementing Co., Claude Parsons, vice president, Duncan, Okla.

Booths 1-2—Hercules Powder Co., M. R. Budd, assistant advertising manager, Wilmington, Del.

Booth 33—Holmberg Aerial Survey Co., 605 North Michigan Boulevard, Chicago, Ill.

Booth 25—Hughes Tool Co., Gordon Richmond, general sales manager, Houston, Tex.

Booth 28—Illinois Powder Manufacturing Co., George H. Neff, assistant sales manager, St. Louis, Mo.

Booth 0—Kelly Map Co., Kennedy Building, Tulsa.

Booth 34—Koenig Iron Works, E. H. Koenig, Houston, Tex. (King autopower wrenches.)

Booth 24—Laughlin-Simmons & Co., R. W. Laughlin, 615 Oklahoma Building, Tulsa. (Well elevator service.)

Booth 15—Reed Roller Bit Co., H. O. Heller, advertising manager, Houston, Tex.

Booths 30-31—Seismograph Service Corp., W. G. Green, vice president, Kennedy Building, Tulsa.

Booth 9—Southern Plastic Co., John W. Flude, president, 1500 Heiner Street, Houston, Tex. (Well tubing.)

Booth 11—Spencer Lens Co., N. F. Cutting, sales division, Buffalo, N. Y. (Microscopes.)

Booths 6-7-8—Edgar Tobin Aerial Survey, James Atkinson, Gulf Building, Houston, Tex.

Booth 29—Well Surveys, Inc., 709 Kennedy Building, Tulsa. (Gamma ray.)

Educational exhibits have also been presented by the following:

Arkansas Geological Survey.
Georgia Department of Forestry and Geology.
Illinois State Geological Survey.
State Geological Survey of Kansas.
State Department of Mines and Minerals (Kentucky).
Missouri Bureau of Geology and Mines.
Mississippi State Geological Survey.
Oklahoma Geological Survey.
South Dakota Geological and Natural History Survey.
Bureau of Economic Geology (Texas).
West Virginia Geological Survey.
Pure Oil Co.
McGraw-Hill Book Co.
The Bobbs-Merrill Co.

ABSTRACTS... of Papers

American Association of Petroleum Geologists

EASTERN INTERIOR BASIN

APRIL 11—MORNING

Chairmen: F. W. DeWolf, M. W. Fuller

ALFRED H. BELL (Illinois Geological Survey, Urbana, Ill.).

Developments in the Eastern Interior Basin, 1939-1940.

Although Mississippian rocks continue to contribute the major part of the oil produced in this region, the outstanding new feature is the discovery and development of Devonian limestone wells in five pools, Sandoval, Salem, Bartelso, Centralia, and Tonti (in order of discovery). The saturated zone in the Devonian consists of dolomitic limestone with solution cavities, and probably fissures and joints. In the pools listed the top of Devonian limestone lies from 1,100 to 1,400 ft. below the McClosky oolitic limestone (the lowest large producing zone in the Mississippian), and this interval probably increases to more than 2,000 ft. in the deepest part of the basin. Initial productions of the new Devonian wells are exceptionally high for the area, some exceeding 10,000 bbl. per day, thus indicating a high degree of permeability of the oil-bearing rock.

Thus far all the new areas of Devonian production are on structural closures in Mississippian or Pennsylvanian key beds (or both) and furthermore are in areas of previous production from shallower strata. Whether or not there are structures affecting Devonian but not younger strata and of sufficient size to cause oil accumulation is not yet known.

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C. J. HARES (Ohio Oil Co., Marshall, Ill.).

Review of Structural Discoveries in the Illinois Basin.

The paper deals with the progressive structural discoveries in and around the eastern interior basin beginning with the early pioneers and continuing to the present time. Some of the scientific discoveries contributed by the oil industry are: (1) The northeast-southwest structural trends which are not, as normally expected, parallel to the northwest-southeast trending La Salle anticline, but at an angle of nearly 45° to it; (2) that the new oil fields not only occur on local domes along these trends but some fields have been discovered in almost the very bottom of the structural basin; and (3) the difference in the degree of folding in the Devonian and Mississippian formations, as indicated by deep drilling.

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P. L. DANA and E. H. SCOBEY (Gulf Refining Co., Mattoon, Ill.).

A Cross-Section of the Chester Series of the Illinois Basin.

The correlations of the formations of the Chester from Randolph County, Illinois, to Hancock County, Kentucky, are illustrated with sample logs. Basal Pennsylvanian sands and shales rest unconformably on various Chester formations from the Menard to the Kinkaid. The Menard, Glen Dean, Hardinsburg, Golconda, and Cypress formations are continuous across the basin. An eastward thickening into the basin of the strata lying above the distinctive basal Paint Creek limestone and beneath the Golconda formation and a compensating eastward thinning of the strata between the basal Paint Creek limestone and the Ste. Genevieve are noted. The sandstones, shales, and thin limestones between the Paint Creek and the Ste. Genevieve are traced eastward into the deep part of the basin where they grade laterally into heavy limestones which some workers have considered to be of Ste. Genevieve age.

GENERAL SESSION

Joint session with Society of Economic Paleontologists and Mineralogists and Society of Exploration Geophysicists, April 10 9:30 a.m.—12 noon.

Henry A. Ley and Verner Jones, presiding.

M. M. Leighton, chief, Illinois Geological Survey, Urbana, Ill., address of welcome.

Henry A. Ley, president of the association, response.

Ed. W. Owen, secretary-treasurer of the association, memorials.

Henry A. Ley, president of the association, presidential address: "This Association."

Gayle Scott, president of the Society of Economic Paleontologists and Mineralogists, presidential address: "Ecological Factors Controlling the Distribution of Cretaceous Ammonoids in the Texas Area."

E. A. Eckhardt, president of the Society of Exploration Geophysicists, presidential address: "The Partnership of Geology and Geophysics in Prospecting for Oil."

R. W. Richards, U. S. Geological Survey, Washington, D. C., "New Oil Supply and Production in the United States, 1913-1939."

F. H. Lahee, chief geologist, Sun Oil Co., Dallas, Tex., "Results of Exploratory Drilling in the United States in 1939."

RESEARCH COMMITTEE SYMPOSIUM

April 10, 2 p.m.—4:30 p.m.—"New Ideas in Petroleum Exploration With Their Significance to Petroleum Geology." A. I. Levorsen and Monroe G. Cheney, presiding.

A. I. Levorsen, introduction.

Paul E. Fitzgerald, chemical engineering.

C. V. Millikan, petroleum engineering.

E. A. Eckhardt, geophysics.

E. E. Rosaire, geochemical exploration (soil analysis).

F. H. Lahee, "Where Will Our Young Graduates in Petroleum Geology Acquire Field Experience."

E. DeGolyer, "Future Position of Petroleum Geology in the Oil Industry."

D. C. RANDALL (Carter Oil Co., St. Elmo, Ill.).

Geology and Development of the Louden Pool, Fayette County, Illinois.

The Louden pool, in eastern Fayette County, Illinois, is the largest in areal extent in the eastern interior coal basin. Production, which is from three sands of the Chester series, averages 75,000 bbl. of oil per day. The structure is an asymmetrical anticline, plunging to the southwest. Vital drilling and production problems are created by the variable sand conditions found in this near-shore, shallow-water type of deposition. Electrical logging has played an important part in the development of the pool, as well as serving for a more accurate estimation of reserves, and forming the basis of a controlled shooting program. A unique system of high pressure, early life, gas injection is in operation over a large part of the pool with excellent results. Multi-sand completions, based on removable sections of casing, is common practice in the Louden pool.

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L. E. WORKMAN (Illinois Geological Survey, Urbana, Ill.).

Subsurface Geology of the Devonian in Illinois.

From its maximum development in southern Illinois, the Devonian thins northward as a result of progressive overlap upon a land mass which was present during Devonian times in Central Illinois. Northwest of the land mass only Upper Devonian formations are present, thickening to the northwest to a maximum near Rock Island. Structural movements and erosion preceded the deposition of the New Albany black shale. To date oil has been produced from only the Upper Devonian weathered dolomitic limestone and porous sandstone.

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CHARLES W. WILSON, JR. (Vanderbilt University, Nashville, Tenn.) and KENDALL E. BORN (State Division of Geology, Nashville).

Geology of the Nashville Dome.

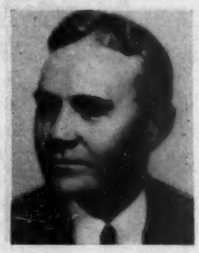
During the past 10 years many surface and subsurface elevations have been accumulated from several key horizons within that part of Tennessee between Cumberland Plateau on the east and the Western Valley of Tennessee River on the west. From these data structural contour maps have been compiled on the top of the Chattanooga shale (Kinderhook group of the Mississippian system), on the Pencil Cave horizon (Metabentonite bed, T-3, near the top of the Black River group of the Ordovician system), and on the top of the Canadian series (Ordovician system). This study is supplemented by two isopach maps of central Tennessee, one showing the variation in thickness of the interval between the base of the Chattanooga shale and the Pencil Cave horizon, and the other the interval between the Pencil Cave and the top of the Canadian.

C. W. WILSON

C. R. LONGWELL (Yale University), CHARLES H. BEHRE, JR. (Northwestern University, Evanston, Ill.).

Tectonic Map of North Central United States.

Under the auspices of the National Research Council and the chairmanship of Mr. Longwell, a committee is assembling a tectonic map of the United States, on the same scale as the geologic map of the United States, published at the time of the International Geological Congress meeting in Washington, 1934. The section of the upper Mississippi Valley, including the states from the Canadian border to the southern boundary of Ohio, Illinois, and Iowa, and from the Black Hills on the west to the eastern boundary of Ohio on the east, is assembled and submitted for criticism. The pre-Cambrian areas of outcrop are shown in patterns distinguishing igneous and metasedimentary rocks, trend lines and folds in the latter being indicated by conventional symbols. The structure of the rest of the area is shown by structure contours, larger basins and geanticlines being indicated by overprint, and smaller structures by superimposed conventional symbols.



C. R. LONGWELL

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KENDALL E. BORN (State Division of Geology, Nashville, Tenn.).

Paleozoic Wells in the Mississippi Embayment in Tennessee.

To date 23 wells in the Mississippi embayment area of Tennessee have been drilled to or into Paleozoic rocks. A generalized map showing the configuration of the pre-Upper Cretaceous surface is presented. Recent sample studies indicate that much of the Paleozoic floor in Western Tennessee is composed of rocks considerably older than has been previously suggested. The Paleozoic lithology of several wells is described and tentative correlations in the light of new data are discussed.

MICHIGAN AND APPALACHIAN BASINS

APRIL 11—AFTERNOON

Chairmen: R. B. Newcombe, M. G. Gulley

R. B. NEWCOMBE (Consulting Geologist, Grand Rapids, Mich.).

Developments in Michigan During 1939.

During 1939 the limelight was taken in Michigan by three fields, Bloomingdale (Van Buren County), Temple (Clare County), and Walker or Grand Rapids (Kent County). The year established a definite Traverse producing area of regional magnitude in the southwest part of the state. The other active fields were Wise (Isabella County), North Salem and East Salem extension (Allegan County), South Columbia or Bear Lake (Van Buren County), East Columbia and Berlamont (Van Buren County), Dundee (Monroe County), and Wisner (Tuscola County).

There was active drilling for "Michigan stray" gas southeast of the Temple field and for Berea gas in the Clayton field (Arenac County). A new shallow (Berea ?) gas area was discovered in Wright and Polkton townships, Ottawa County.

F. W. DE WOLF

M. W. FULLER

The oil discoveries of the year were seemingly of minor importance in making large new reserves available. These were Hopkins (Allegan County), Bangor (Van Buren County), Zeeland (Ottawa County), Porter (Van Buren County), Silver Creek (Cass County), South Overisel (Allegan County), and Hope (Barry County). Wildcatting was much more extensive in southwestern Michigan than in the "basin," which explains the localization of the discoveries.

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J. B. MAEBIUS (Gulf Refining Co., Saginaw, Mich.).

Temple Field, Freeman-Redding Pools, Clare County, Michigan.

The Temple field, located in Townships 18 and 19n, Range 6w, contains two separate areas of production with a structural saddle separating the two closures. Freeman, the south pool, contains approximately 575 acres, and Redding the north pool, whose limits are not entirely defined, 1,750 acres. The Freeman pool was drilled on a 10-acre spacing plan, while the Redding pool was drilled on 20-acre units. The producing formation is a coarsely crystalline porous dolomite flanked on the north and south by dense limestone. There is a difference of opinion as to whether the producing formation is Dundee of Middle Devonian age or Monroe of Lower Devonian age. If it is Monroe, the Dundee overlaps the flanks of a Monroe structure. If it is Dundee, there has been a lateral transition from limestone to dolomite. The Dundee-Monroe occurs from 3,850 to 3,900 ft. Individual wells have produced initially at the rate of 500 bbl. per hour. The average is from 50 to 75 bbl. per hour.

The first formation capable of structural interpretation is the Michigan series of Mississippian age, occurring approximately at 1,100 ft. However, the structure on this formation does not conform in detail to the closure on the Dundee-Monroe.

●

C. H. RIGGS (Department of Conservation, Grand Rapids, Mich.).

Geology of the Walker Oil Field.

The Walker field, near Grand Rapids, is the largest of Michigan's Traverse oil fields and is located on a broad northwest-southeast anticline near the outer rim of the Michigan basin. The structure is greatly modified by numerous northeast-southwest cross folds. Total closure is about 80 ft. of which the top 50 ft. are productive of oil. The top "pay" 3 to 5 ft. below the top of the Traverse limestone contains gas in structurally high wells and edge water in low wells. Porosity in the lower, more prolific, "pay" decreases off structure and is apparently greatly influenced by primary porosity in reef coral fragments. Recovery estimates for the Traverse formation vary from 2,500 to 3,000 bbl. per acre. There is a possibility that Dundee production may be obtained 300 to 350 ft. below present wells when a deep test well is drilled on structure.

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MARGARET STEARNS BISHOP (consulting geologist, Paw Paw, Mich.).

Isopachous Studies of the Ellsworth to Traverse Limestone Section of Southwestern Michigan.

Regionally, the Red Rock to Traverse limestone interval thickens toward the west and northwest, due principally to thickening of the Ellsworth formation, and possibly to some thickening of the Antrim formation in these directions. Locally, the thickening off structure, which takes place throughout the section between the Traverse limestone and the Coldwater Red Rock, tends to obliterate minor structural or topographic irregularities existing on the surface of the Traverse limestone and to minimize in the younger beds the degree of dip off the flanks of the larger structural features. Evidence for the existence of an Ellsworth basin in southwestern Michigan is fairly definite, and the possibility that such a basin may have existed during the deposition of the Antrim formation is suggested.

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DONALD B. MacLACHLAN (Wayne University, Detroit, Mich.).

Structure in Southeastern Ontario and the Thumb of Michigan as Revealed by Late Quaternary Warping.

The pre-Cambrian land mass of northeastern North America was the center of post-glacial tilting, but there also exists a close relationship between late Quaternary warping and earlier folding of the Paleozoic strata. The total deformation of the water plane of Lake Warren consists of (1) *regional* uptilting in a northeasterly direction, and (2) *local* differential deformation. *Regional* uptilting has been in general toward the boundary of the pre-Cambrian land mass. The *local* deformation is of a two-fold character—(*a*) there is an area of maximum local uplift, the axis of which is coincident with the northern extension of the northeast arm of the Cincinnati anticline, and (*b*) secondary local deforming movements have for their foci the minor anticlines and synclines of the Paleozoic strata.

●

CARL C. ADDISON (Pure Oil Co., Saginaw, Mich.).

Buckeye Oil Field, Gladwin County, Michigan.

The Buckeye oil field, Gladwin County, consists of two separate oil pools which are quite unlike in their ability to produce oil. Though the two pools are comparable as to size and structure, the north pool had produced to the end of 1939 some 13,000,000 bbl. of oil as compared to less than 3,400,000 bbl. for South Buckeye. This difference in productivity is attributed to a lateral change in the lithology of the producing limestone which resulted in decreased porosity and lower permeability.

Subsurface maps show the structure to be a northwest-southeast trending, asymmetrical, nearly flat topped anticline, with maximum dips approaching 200 ft. per mile along the southwest flank. Formations drilled are Pennsylvanian, Mississippian, and Devonian in age, while production is from the Devonian Dundee limestone. Producing wells average 3,627 ft. in depth.

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THURMAN H. MYERS (Carnegie Natural Gas Co., Pittsburgh, Pa.).

Deep-Sand Developments in the Appalachian Region During 1939.

Results of developments for "deep" sand oil and gas in the Appalachian region during the past year have been discouraging. Two Oriskany sand gas pools were discovered in southern New York, and two in northern Pennsylvania, but none was of any great extent. Two new Oriskany gas pools were discovered in Jackson County, West Virginia, but neither has been tested sufficiently to indicate their extent. In Kanawha and Jackson counties, West Virginia, the Elk-Poca Oriskany field was extended to the north and northwest to embrace approximately 10,000 additional acres with a possible increase in reserve of 60,000,000,000 cu. ft. of gas.

●

ROBERT C. LAFFERTY (The Owens, Libbey-Owens Gas Department, Charleston, W. Va.).

Some Observations Concerning the Sedimentary History of the Central Part of the Appalachian Basin.

The Appalachian geosyncline is made up of three major basins—a northern one with its thickest accumulation of sediments near Altoona, Pa.; a central basin with its depositional axis near Elkins, W. Va.; and a southern basin with its center near Birmingham, Ala. This paper is concerned only with the central basin. Evidences of recurrent folding in anticlines with northeast-southwest axes from early Devonian to the present, producing horizons, present and potential, from Pennsylvania to Ordovician and deep regional markers are discussed. Two generalized cross-sections traversing the Pittsburgh-Huntington syncline in northwest-southeast and northeast-southwest directions are presented to show the relationships between the various horizons discussed.

●

HAROLD R. WANLESS (University of Illinois, Urbana).

Pennsylvanian Sedimentation in a Part of the Southern Appalachian Coal Fields.

The Pennsylvania strata of southwestern West Virginia, eastern Kentucky, Virginia, Tennessee, and northwestern Georgia attain a maximum thickness of about 6,000 ft. in Wise County, Virginia, and Harlan County, Kentucky. They are largely of Pottsville age, except in the extreme northeastern portion of Kentucky and the northern part of southern West Virginia. The sediments are predominantly sandstones, siltstone, and shales with lesser amounts of coal, conglomerate, underclay, limestone, and chert. Fossil plants are numerous in shales overlying coal beds and elsewhere in the section. Marine and brackish water or fresh water invertebrates are found at several horizons in shale, limestone, siltstone and calcareous sandstone. Conglomerates contain principally small rounded pebbles of vein quartz or locally derived more angular pebbles.

The section attains its maximum thickness along its southeastern margin in the Allegheny front, thinning quite rapidly northwestward. Certain faulted anticlines or overthrusts occupy belts of unusually rapid change of thickness so that they appear to have been hinge lines separating areas of unequal downwarping. The thinnest sections adjoining the Nashville and Cincinnati domes exhibit a complex series of overlaps, so that in northern Tennessee the section increases in thickness nearly ten-fold within about 50 miles southeast from this border. Conglomerate occurs at several horizons along the southeast border of the field at which it is absent a few miles farther northwest. There are also important variations in thickness and lithology along the strike. In southern Tennessee a series with numerous shales, coals, and thin sandstones passes within a few miles along strike into a series of massive cliff-forming conglomeratic sandstones almost without coals, which cap Signal and Lookout Mountains near Chattanooga.

●

R. E. SHERRILL (University of Pittsburgh).

Some Problems of Appalachian Structure.

The Appalachian foreland lies north and west of a closely folded and faulted mountain zone. The search for oil and gas production from deeper horizons has emphasized the importance of an understanding of the structure of this area. This structure is much more complex than was formerly supposed. That the stresses active in forming the foreland folds and faults represent principally the diminishing activity of the deforming thrusts of the associated mountains is the usual assumption, but little is known of the mode of transmission and application of these stresses.

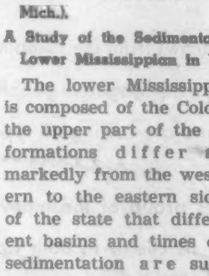
●

LUCILLE HALE (Department of Conservation, Lansing, Mich.).

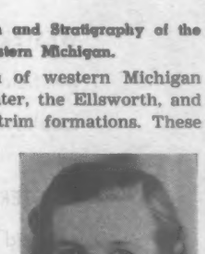
A Study of the Sedimentation and Stratigraphy of the Lower Mississippian in Western Michigan.

The lower Mississippian of western Michigan is composed of the Coldwater, the Ellsworth, and the upper part of the Antrim formations. These formations differ so markedly from the western to the eastern side of the state that different basins and times of sedimentation are suggested. In the Coldwater the basal red member is a fossiliferous limestone rather than a shale; several very fossiliferous zones rich in crinoids, ostracods, and bryozoans with some brachiopods, gastropods, cephalopods, and pelecypods appear quite consistently; clay-ironstone concretions seem more abundant; and higher in the section the "Coldwater lime," which is a light gray dolomite more often than a limestone, shows embedded crystals of secondary dolomite and "pepperings" of glauconite. The Ellsworth is present only in this western area of Michigan and is a gray and gray-green shale with a number of gray dolomite zones. Small pyrite concretions and spore cases are present throughout. Near the contact of the Ellsworth-Coldwater there seems to be a localized oolite zone of a buff limestone with the central core of the oolites of light brown dolomite. When the oolites are absent the zone is a brown, crystalline dolomite which often produces gas. Stratigraphically this horizon could perhaps be called Berea, but lithologically it is different from the Berea sandstone farther east in the basin.

The green shales of the Ellsworth grade into and alternate with the black shales of the Antrim so that it is difficult to pick a true top. There are no outcrops in this section so all correlation must be made from well logs and samples. The recent developments have added considerable information and future work will undoubtedly define the paleogeography.



M. G. GULLEY



K. H. CRANDALL

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PAUL H. PRICE (State Geologist, Morgantown, W. Va.) and H. P. WOODWARD (University of Newark, New Jersey).

The Devonian System of West Virginia.

The Appalachian area is being reexamined critically by the petroleum geologists for possible older and deeper production. The surface Devonian rocks in West Virginia are well known and entirely mapped on a 1:62,500 scale. Their subsurface equivalents are fairly well known from studies of many deep-well sections. In order to facilitate the work of petroleum stratigraphers from outside areas, an attempt is here made to reexamine and reclassify our Devonian stratigraphy in line with the more generally accepted nomenclature, consistent with priority of usage, and also to simplify rather than further complicate it, so far as possible.

H. P. WOODWARD

P. H. PRICE

MID-CONTINENT AND ROCKY MOUNTAIN REGIONS

APRIL 12—MORNING

Chairmen: Ira H. Cram, C. E. Dobbin

EDWARD A. KOESTER (Darby Petroleum Corp., Wichita, Kans.).

Recent Developments in the North Mid-Continent.

Drilling activity in Kansas dropped about 13 per cent below the previous year and 48 per cent below 1938. Wildcatting was practically at a standstill, except in northeast Kansas, where a dozen stratigraphically deep tests were drilled in the Forest City basin and north flank of the Chautauqua arch. Norton and Phillips are new oil-producing counties, but the discovery well in each is small and of questionable commercial value. A gas discovery in Sherman County producing from the Cretaceous is important only because it is in a previously unproductive county and producing horizon.

In South Dakota wells in Union and Charles Mix counties were completed in pre-Cambrian rocks, adding much valuable stratigraphic information. There was a little drilling activity in the Iowa portion of the Forest City basin, but no completions.

The plains portion of Colorado received further

setbacks during the year when Continental Oil Co. abandoned its Prowers County test in the Arbuckle at 5,680 ft. and Plymouth Oil Co. abandoned a well in Elbert County in the Permian (Lykens ?) at 7,578 ft.

A study of the stratigraphic data revealed by the drill in the area of this review during the past few years shows that many old published ideas must be abandoned completely and others must be radcially revised.

●

LEWIS W. MacNAUGHTON (DeGolyer, MacNaughton, & McGhee, Dallas, Tex.).

Recent Developments in the South Mid-Continent.

●

IRA H. CRAM (Pure Oil Co., Tulsa).

Stratigraphy and Structure of the Northeastern Wichita Mountains, Oklahoma.

Detailed surface mapping of the Wichita Mountain area has uncovered stratigraphic and structural data of unusual interest. The Cambrian, Ordovician, Silurian, and Devonian formations resemble closely those exposed in the Arbuckle Mountains to the southeast. The Mississippian and Pennsylvanian formations present some important differences. Permian red beds overlap all older formations. The entire section has not been seen at the surface or in wells, but in excess of 30,000 ft. of Paleozoic sedimentary rocks are known to be present in the area. The structure of the older rocks exposed in the mountains is in places very complex. Two faults with throws approaching 5,000 ft. are of particular interest.

●

MALVIN G. HOFFMAN (Midco Oil Corp., Tulsa, Okla.).

The Structural History of the Billings Field Interpreted in Terms of Isostasy.

The Billings field was thrust upward periodically from earliest Paleozoic times until the beginning of the Pennsylvanian period. These movements resulted as a partial compensation for the great thicknesses of sediments which were being deposited in adjacent basins and which could be accommodated only by downward movements. From the beginning of the Pennsylvanian to the close of the Permian, the Billings structure itself experienced periodic downward movements to compensate for the deposition of over 4,000 ft. of sediments which were laid down on top of it.

●

THOMAS A. HENDRICKS (U. S. Geological Survey).

Structure of the Western Part of the Ouachita Mountains.

The western part of the Ouachita Mountains is characterized by long arcuate thrust faults that have a southerly trend in the western part of the area and an easterly trend farther east. In general, the faults break lower Pennsylvanian strata, but a few faults bring areas of older Paleozoic rocks to the surface.

There are four major faults that are independent sole faults at least locally. They are, from northwest to southeast: (1) The Choctaw fault, (2)the Pine Mountain fault, (3) the Ti Valley fault, (4) the Windingstair fault.

The upper block of each of these faults has

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been thrust from south to north and has been broken by numerous smaller, high angle reverse faults that presumably join their associated sole faults at depth. Minor cross faults are numerous, particularly south of the Windingstair fault, and larger cross faults are present in several structural settings.

Structural and stratigraphic relationships in the area can be explained only by the postulation of an overthrust from the northwest that carried rocks of Arbuckle facies southeastward. Later the entire area, as well as the coal basin to the north, was covered by the Atoka formation, after which compression occurred as a part of the movement tending to establish isostatic equilibrium for the area covered by the thick wedge of light sediments of the Ouachita geosyncline. That compression produced the north-northwestward thrusting and established the present structural pattern of the Ouachita Mountains. The total crustal shortening by movement on thrust faults in the area is estimated to be of the order of magnitude of 60 to 80 miles.

●

W. O. THOMPSON (University of Colorado, Boulder), and J. M. KIRBY (The California Co., Denver).

Permo-Pennsylvanic Stratigraphy Between Colorado Springs, Colo., and the Black Hills, S. D.

It is concluded (1) that the Ingleside formation represents a seaward facies of the Fountain arkose; (2) that the Casper formation of Laramie basin, Wyoming, as defined by Dr. S. H. Knight in 1929, is the approximate equivalent, in time and sedimentary environment, of the Ingleside formation of the northern Colorado Front Range; (3) that Divisions II to VI inclusive of the type section of the Hartville formation of Reed and Condra are the approximate time equivalent of the Ingleside and Fountain formations; (4) that the Converse, Leo, and Bell sandstone zones of the Lance Creek oil field are represented in Divisions I, II, and VI, respectively, of the Hartville formation; and (5) that the Minnelusa formation, at its type locality on the east side of the Black Hills of South Dakota, is restricted to Hartville formation Divisions I and II, and no older than the Leo horizon of the Lance Creek oil field.

●

GLEN G. BARTLE (University of Kansas City) and RUFUS W. SMITH (Panhandle Eastern Pipe Line Co., Kansas City, Mo.).

The Relative Porosity and Permeability of the Producing Formations of the Hugoton Field as Indicated by Gas Withdrawals and Pressure Declines.

In the Hugoton gas field in southwestern Kansas there are now wells which have been producing gas for approximately 12 years, and have declined more than 10 per cent of their initial pressure. With data from 284 wells available it is now possible to study the relation of pressure decline and well spacing to the total gas withdrawals weighted with respect to acreage in areas of equal pressure decline. The recent practice of treating the dolomitic-limestone producing formations with acid has introduced a new complex factor into this study.

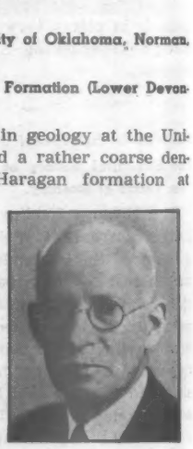
G. G. BARTLE

●

CHARLES E. DECKER (University of Oklahoma, Norman, Okla.).

Graptolites From the Haragan Formation (Lower Devonian) of Oklahoma.

Perry Sollars, a student in geology at the University of Oklahoma, found a rather coarse dendroid graptolite in the Haragan formation at White Mound and the writer found a more delicate form and a *Chaunograptus* at the same locality. While the parts collected represent only fragments of colonies, they show characteristics sufficiently well to describe them as new species. These forms are prized highly as they are the first graptolites to be found in the Devonian of Oklahoma. The new species will be named and described and their special features noted.



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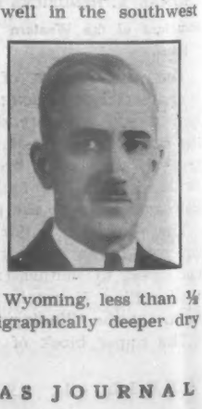
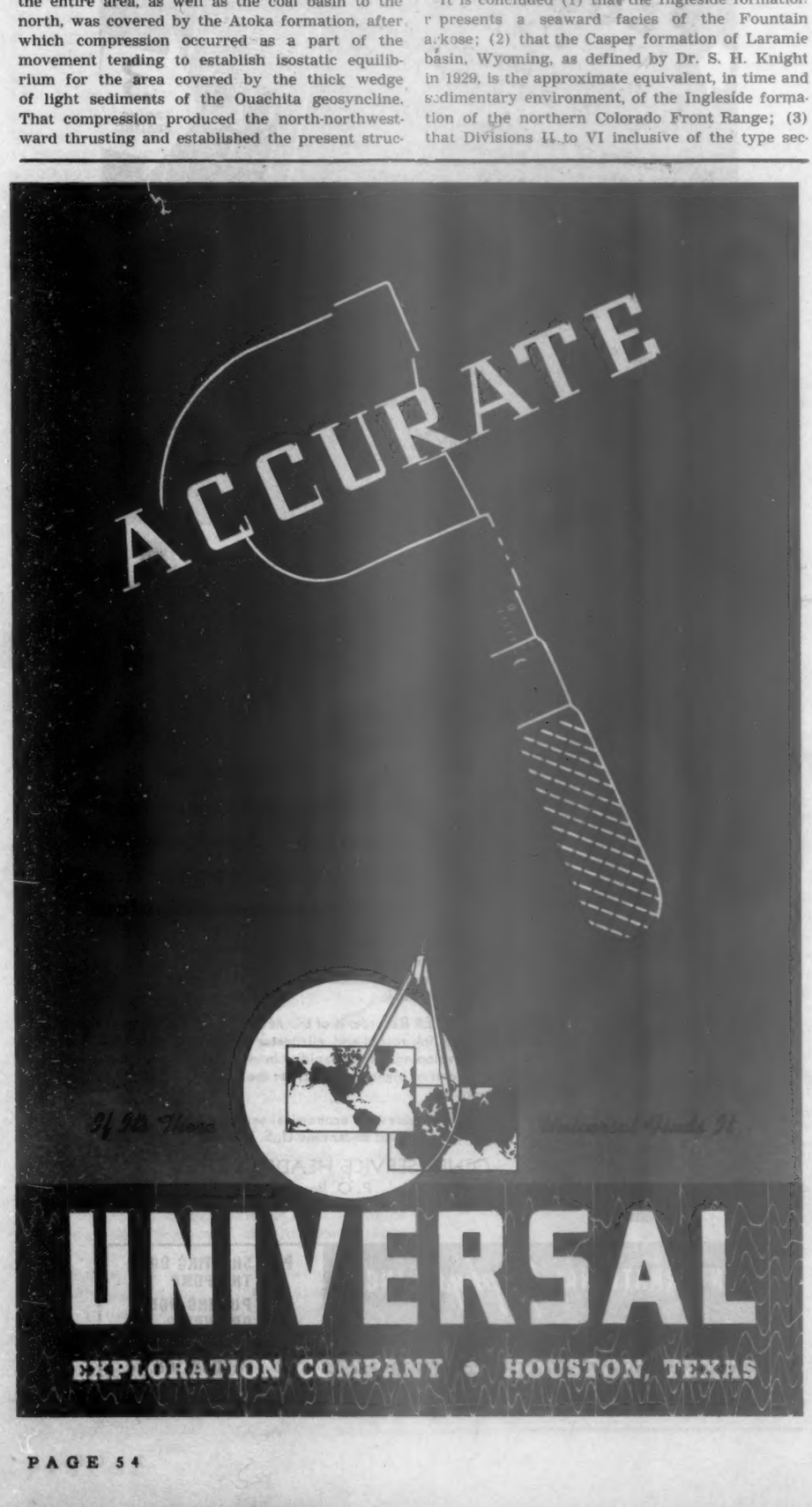
C. E. DOBBIN (U. S. Geological Survey, Denver, Colo.).

Developments in the Rocky Mountain Region in 1939.

There were no relatively important oil and gas discoveries in the Rocky Mountain region in 1939 in unproved areas. One well in the southwest Pondera or Pendroy district, Teton County, Montana, produced a little oil from the Madison limestone, but was considered noncommercial and was saved as a gas well in the Colorado shale. The only other discovery in an unproved area was a relatively small gas well on the Horn Valley anticline, Carbon County, Wyoming, less than ½ mile southeast of a stratigraphically deeper dry hole.





The deepening of oil wells farther into the Tensleep sandstone resulted in relatively large oil production in the old Wertz gas field, Carbon County, Wyoming. In the Lance Creek field, Niobrara County, Wyoming, a rather widespread and prolific oil zone was found in the Minnelusa sandstone as much as 200 ft. below the oil-producing Leo sand; and in the old Fort Collins field, Larimer County, Colorado, a well deepened to the second sand of the Dakota group tested about 300 bbl. of oil and some water daily.

Wildcatting was very much restricted throughout the region in 1939. One wildcat well is shut down near Pinedale, Sublette County, Wyoming, at a depth of 10,000 ft. and another was abandoned at Divide Creek, Mesa County, Colorado, at a depth of 10,815 ft., being the deepest well yet drilled in the region. In addition, there were only six other really important wildcat wells completed in the region in 1939.

●

E. B. BRANSON (University of Missouri, Rolla, Mo.) and C. C. BRANSON (Brown University, Providence, R. I.). Stratigraphy and Structures of the Wind River Mountains of Wyoming.

The Wind River Mountains are made up of a core of pre-Cambrian granodiorites, except at the south end, where schists predominate. On the northeast flank the dips of the sediments range from 10° to 15°. The dipping sediments range from Cambrian to late Cretaceous in age with only the Silurian absent. Eocene, Oligocene, Pliocene, and Pleistocene overlap the older formations in some places. On the east side a series of anticlines parallels the main range about 15 miles from the summit. Minor faults affect the anticlines as well as the main range on the east side and the pattern of the lakes indicates much faulting on the pre-Cambrian core.

E. B. BRANSON

C. C. BRANSON

The main uplift and folding of the range came at the close of the Mesozoic, but minor uplifts occurred during the Cenozoic. That the uplifts were irregular is indicated by the absence of Ordovician and Devonian at the south end, and the pinching out, north of the range, of the Tensleep, Phosphoria, and Chugwater. The Lander sandstone at the base of the Ordovician in the southern end of the Wind River Mountains is absent at the northern end and thickens to 80 ft. or more on the east side of the Big Horns.

●

C. E. ERDMANN (U. S. Geological Survey, Denver). Principles of Oil Accumulation in the Cut Bank District, Montana.

Production in Cut Bank is obtained chiefly from the basal sandstone zone of the continental Kootenai formation, lowest Cretaceous in age, which rests disconformably upon the marine upper Jurassic Ellis formation, regarded as the source of oil. Structurally the district is well down the west flank of Kevin-Sunburst dome where a regional dip of 50 ft. per mile S. 70° W., is locally modified by a peripheral series of north-plunging anticlinal noses, which are especially prominent in the north end of the district where there are local areas of closure. Accumulation is a consequence of up-dip migration into stratigraphic traps, of which there are several types. In the northern part of the oil area, and in the gas area, structural deformation has tended in general to increase the effect of stratigraphic traps. There is also some evidence for vertical migration through fractures.

Incomplete stratigraphic studies indicate that the basal Kootenai sands were laid down upon a moderately smooth plain sloping gently to the northeast. The age of this surface is not established positively, but probably it is post-Morrison. Erosional and structural features can be identified upon this old surface, and both appear to have had some part in controlling the distribution of the basal Kootenai sand, which in turn affects the distribution of the oil and gas. During deposition of the lower Kootenai, subsidence took place progressively westward into the Rocky Mountain geosyncline, the movement being virtually complete by Sunburst time. Westward tilt in the Cut Bank district amounted to about 8 ft. per mile, and increased westward to over 40 ft. per mile. This produced flattening and reversal of the pre-Sunburst beds, and set the stage for an early period of oil accumulation. Conditions remained essentially static, stratigraphic load increasing until the late-Cretaceous-Paleocene deformation which inaugurated the major period of migration and accumulation.

●

R. L. CLIFTON (Champlin Refining Co., Enid, Okla.). The San Andres Group in Oklahoma and Adjacent Areas.

A Permian section now referred to the Leonard series extends from northern Barber County in Kansas through Oklahoma and into Texas. These Permian beds, regarded as the stratigraphic equivalents of the San Andres group, are divided into four formations, namely:

The Cedar Hills and its equivalents, the Duncan and the San Angelo, predominantly a sandstone formation, includes shales and some inorganic precipitates.

The Flowerpot, which overlies the Cedar Hills,

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exhibits a series of uniformly well stratified exposures.

The Blaine is an important and well-recognized formation, although in southwestern Oklahoma and Texas its upper and its lower limits have heretofore been vaguely recognized or not at all differentiated. It consists of four —three in Kansas—massive precipitate members, lithologically, of gypsum, anhydrite, dolomite, and limestone, and their interbedded shales. In fresh or in less weathered exposures the relative importance of the dolomites and limestones to the gypsums and anhydrites is not readily apparent, but at weathered exposures this relative proportionate importance may be observed.

The Dog Creek, overlying the Blaine, is the uppermost formation of the San Andres in Oklahoma and adjacent areas. The youngest of the Dog Creek is defined by what is considered an unconformity at the base of the Whitehorse sandstone, wherever this sandstone is not removed by erosion.

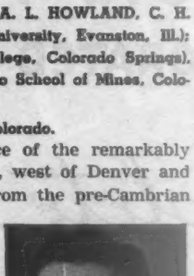
The San Andres group in Oklahoma and adjacent areas presents problems related to correlation, to paleontology, to stratigraphy, to deposition of the Permian basin type, and to lithology and association of precipitates.

●

J. T. STARK, W. E. POWERS, A. L. HOWLAND, C. H. BEHRE, JR. (Northwestern University, Evanston, Ill.); D. B. GOULD (Colorado College, Colorado Springs), and J. H. JOHNSON (Colorado School of Mines, Colorado).

The Structure of South Park, Colorado.

The sedimentary sequence of the remarkably flat depression, South Park, west of Denver and the Front Range, ranges from the pre-Cambrian to the Pleistocene. Most conspicuous are (1) the Paleozoic sequence typical of the Mosquito Range, (2) the usual Cretaceous sediments, and (3) a series of Tertiary fresh-water (lacustrine) and subaerial deposits of Oligocene to Pliocene age with vertebrate and invertebrate fossils. The main structure of the park is monoclinal, with eastward dip, broken on the east by the Elkhorn fault, traceable for 26 miles, which brings pre-Cambrian to the east upon Paleocene conglomerates. Occasional "klippen" lie west of the great thrust. West of this, near the middle of the park, is a lesser but conspicuous fault, with an associated minor syncline. Numerous smaller, oblique faults are conspicuous in the middle part of the park. It is east of these, in a small plunging fold, that two test wells have been drilled. Farther south volcanics preponderate, hiding the structure of the sediments.



D. B. GOULD

The history of the park includes "Laramide" orogeny of two subepochs, early Tertiary lava flows of andesite followed by trachyte, Oligocene and later "lake beds," late Tertiary block-faulting, tilting with drainage changes in Pliocene times, and Pleistocene glaciation and alluviation. Cenozoic events, including their relations to presumptive "peneplains," can be worked out with exceptional accuracy, having been marked off by sediments dated paleontologically.

●

W. B. LANG (U. S. Geological Survey).

The Basal Member of Salado Formation.

●

CHALMER J. ROY (Louisiana State University).

Marine Limestone in the Fountain Formation (Pennsylvanian) Near Colorado Springs.

KARL A. MYGDAL (Pure Oil Co., Wichita Falls, Tex.).

Developments in North and West Central Texas, 1939.

Approximately 90 per cent of the production of North and West Central Texas has come from the major positive structural elements: the Bend, Electra, and Muenster arches. Increased attention is now being given the bordering basins, especially the north end of the Fort Worth syncline, in which five new fields were found during 1939. In North Texas shallow reservoirs of Cisco age have contributed by far the greater part of the total production and proven reserves, but shallow production is now declining while deep production, especially from the Strawn, is of ever-increasing importance. Three 1939 discoveries in Archer, Clay, and Montague counties are producing from limestones of Bend age; previously no Bend production had been found north of Young County.

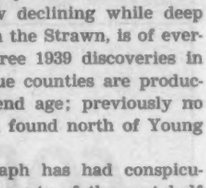
The reflection seismograph has had conspicuous success in the deeper parts of the east half of the North Texas district, but west of the Bend arch it has not yet demonstrated its application except in the discovery of two reef-like masses of Canyon limestone, one of which produces oil in the Seymour field, Baylor County. Surface mapping is no longer an important exploratory tool, but systematic subsurface work is of increasing importance.

●

F. B. PLUMMER and B. F. GRANT (Bureau of Economic Geology, Austin, Tex.).

Geology of the Lampasas Inlier of Paleozoic Rocks in Central Texas.

The inlier of Paleozoic rocks west of the town of Lampasas in Central Texas is shown on all state and U. S. Geological Survey maps as a triangular-shaped area of Pennsylvanian strata surrounded by Cretaceous formations. Recent detailed geologic work in this region indicates that the inlier is due to a broad domal structure of Ordovician rocks nearly 5 miles in diameter and bordered on the northwest by a pronounced normal fault. The Ordovician rocks consist of the upper members of the Ellenburger dolomite. The dolomite is overlapped by Cretaceous strata belonging to the Trinity group except on the east side of the structure where the valleys of Donaldson and Pillar Bluff creeks have been cut deep enough to expose rather narrow bands of Carboniferous formations.



F. B. PLUMMER

CALIFORNIA AND GULF COAST REGIONS

APRIL 12—AFTERNOON

Chairmen: E. R. Atwill, K. H. Crandall

●

E. ROBERT ATWILL (Union Oil Co.).

Significant Developments in California.

Stratigraphic traps have assumed an increasingly important place in the consciousness of California geologists. All possible structures, new and old, are being scrutinized or reviewed with the dominant thought of stratigraphic traps in mind.

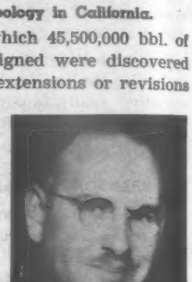
Exploration in the near future in California will probably be guided largely by detailed subsurface studies in the vicinity of proven fields, although prospecting for deeper zones is at present being discouraged. Wildcat drilling is lagging in the state as more and more thought is devoted to the financing and arrangement, under rather severe curtailment, of required development programs in recently discovered fields.

●

ROY M. BARNES (Continental Oil Co., Los Angeles).

Twenty Years of Petroleum Geology in California.

Four new oil fields to which 45,500,000 bbl. of oil reserves have been assigned were discovered in California during 1939; extensions or revisions of existing fields added 257,000,000 bbl. of estimated ultimate production; total 302,500,000 bbl. of new oil. The state's 1939 production was 224,354,048 bbl. Estimated reserves were increased by 78,146,000 bbl. of oil for a total of 3,178,500,000 bbl. as of January 1, 1940. Geological employment and geophysical activity from 1920 to 1939 inclusive are summarized and are correlated with results, namely, new fields discovered, producing wells completed, reserves proved, dry holes drilled, etc.



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FRED A. MENKEN (Tide Water Associated Oil Co., San Francisco).

Eocene Exploration in California.

Although Eocene production has been known in California for 40 years, it was not recognized as an important producing horizon until the recent discovery of Eocene production at Kettleman Hills and Coalinga. The stratigraphic types of accumulations as at Coalinga have been the impetus for detailed study of Eocene deposition and distribution. The Eocene of California is characterized by unconformities, lenticularity, facies changes and extreme variations in thicknesses. The present trend is towards remapping of the outcrop section, correlating and rezoning of the formations and delineation of possible stratigraphic and structural prospects. From present data it appears that the most likely area for future Eocene discoveries is the west-central and southern San Joaquin Valley. The Santa Maria basin and western Los Angeles Basin are void of Eocene. The prospects in the Santa Barbara, coastal and Santa Clara Valley provinces are limited by reason of apparent lack of porosity.

●

F. W. ROLSHAUSEN (Humble Oil & Refining Co., Houston, Tex.).

Notes on the Fossiliferous Frio.

During the past few years numerous wells have been drilled through the Marginulina zone into the Frio. Some of these wells have been drilled through, or deep into, the Frio section. Fossiliferous material (the Hackberry fauna of Garrett) has been found in some of the downdip wells below the Marginulina zone and oil-producing sands are also present in this facies of the Frio.

●

J. A. CULBERTSON (Continental Oil Co., Houston, Tex.).

The Downdip Wilcox (Eocene) of Coastal Texas and Louisiana.

The search for deeper oil-producing horizons, stimulated by several Wilcox discoveries during the past 2 years, has established this group of formations as a major objective over a considerable portion of the Gulf Coast province. Deep

penetration of a new objective formation usually lags several years behind its early exploration and consequently only the upper part of the Wilcox is known, especially when it occurs at extreme depths. Considerable information is available, however, on the general structural attitude, the types of sediment and the porosity permeability and production possibilities of the upper Wilcox sands.

●

O. L. BRACE (Consulting Geologist, Houston, Tex.).

Review of Developments in 1939, Gulf Coast of Upper Texas and Louisiana.

The discovery record for 1939 has again failed to keep pace with the more successful years prior to 1938. Of the 23 new fields listed, it is probable that no more than three or four will ultimately justify a major rating. The intensive activity that was anticipated for the Wilcox zone has resulted in the discovery of only one new field and deepening to production in this horizon in two fields already producing from younger sands. Low relief traps associated with faulting have become an increasingly important source of new reserves. An explanation is offered as to the possible relationship of these structural types to major salt movements. The development of important oil deposits on the flanks of old producing fields has been an outstanding feature of the year.

●

BARNEY FISHER (Geologist, Coronado Corp., Dallas, Tex.).

La Rosa Field, Refugio County, Texas.

La Rosa field was discovered in September 1938 as a result of geophysical work on a large "high" mapped by subsurface. After the area was leased a more detailed seismic survey was made and the first well location staked. A number of interesting maps are shown, including the two geophysical maps and subsurface contour maps based entirely on electrical logs. Two cross-sections made with electrical logs are shown, and producing formations are discussed. Of considerable importance is the fact that nearly all structural movement here occurred previous to the end of Frio deposition.

●

FRED W. BATES (Geologist, Lafayette, La.).

Geology of the Eola Field, Avoyelles Parish, Louisiana.

The Eola field, located in south central Louisiana, in January 1939. The structure had previously been noted by several companies, using reflection seismograph and other means, and its discovery may be accredited entirely to geophysics. It was the first field in this area to produce from the lower Eocene Wilcox (Sabine), and opened an active play for production from this horizon. Some production will be obtained from the Cockfield and Sparta sands after depletion of the Wilcox, although these horizons are far inferior and have not as yet had production tests.

A close study of the structure and isopach maps reveals the field to be on a major nose extending from Cheneyville southeast, with the accumulation being due apparently to faulting. A very complex system of faults is noted, which combined with the structural nose give a producing closure of about 300 ft. Sixty wells are now producing from an area embracing about 1,200 acres, with the field probably three-quarters drilled.

●

M. M. KORNFELD (Consulting Paleontologist, Houston, Tex.).

The Post-Vicksburg Hackberry Zone in the Gulf Coast.

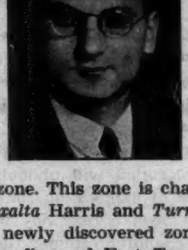
Occupying a paleontological facies between the Vicksburg formation and the Marginulina zone in the Gulf Coast occurs the Hackberry foraminiferal zone in the lower Catahoula (formerly called "Frio"). The recognition of the Hackberry zone has opened up a comparatively new field of geologic research into the oil and gas possibilities of the lower Catahoula in view of the fact that many established oil and gas fields of Texas and Louisiana already produce from this portion of the Post-Vicksburg column. Until J. B. Garrett named and described this foraminiferal assemblage in July 1938 all oil and gas discoveries found in Israelsky's lower Catahoula were lumped together under the obscurity of the name "Frio."

●

H. B. STENZEL (Bureau of Economic Geology, University of Texas).

A New Zone in the Cook Mountain Formation, the Crassatella texalta Harris - Turritella cortezi Bowles Zone.

With the aid of persistent bentonite beds, it is feasible to trace and correlate a portion of the Cook Mountain formation in East Texas. The correlations possible are so detailed that individual beds can be recognized over a distance of over 30 miles. These beds compose the Hurricane marine lentil of the lower Landrum member in the Cook Mountain formation. The stratigraphic significance of this lentil is enhanced by the discovery of a new fossil zone. This zone is characterized by *Crassatella texalta* Harris and *Turritella cortezi* Bowles. This newly discovered zone is traceable beyond the confines of East Texas and allows correlation with corresponding portions in the Cook Mountain of the Rio Grande embayment and Louisiana.



GENERAL PAPERS

APRIL 12—AFTERNOON

F. B. PLUMMER (Bureau of Economic Geology, Austin, Tex.).

Water Cones and Water Sheaths in Oil Wells.

The method of the formation, shape, and appearance of water cones and water sheaths around the periphery of experimental oil wells producing oil and water are illustrated by diagrams and photographs. The cause of these phenomena is discussed briefly, and the effect of water in the sand around a well on the yield of oil is illustrated graphically.

Three ways of reducing the tendency of water penetration into oil sands from wells producing oil and water are discussed and illustrated, namely: (1) Slow withdrawal, (2) downward withdrawal, (3) reduction of interfacial tension between water and oil by chemicals. Sections of oil sands showing oil-water interfaces under these different methods of withdrawal are presented for the first time. The relative merits of the three methods are shown, and the conclusion is reached that oil ratios can be increased and water production in marginal wells reduced by applying physical chemical principles.

F. M. VAN TUYL, W. A. WALDSCHMIDT, JOHN BAIRD (Colorado School of Mines, Golden, Colo.).

Compaction and Flushing of Oil Sands.

A review of previous experimental work and of conclusions drawn therefrom is presented. The procedures and apparatus employed in the present tests are described. The results support the view that the degree of compaction depends upon the amount of loading as well as the conditions of sedimentation. A comparison of the degree of compaction of the experimentally treated sand with that of the original sandstone and of an aqueous deposit of the disintegrated material by means of a technique involving the impregnation of the sands with Canada balsam gave very interesting results.

F. M. VAN TUYL

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IVAN J. FENN (Subterrez, Houston, Tex.).

An Hypothesis for the Origin of Certain Geochemical Anomalies Associated With Oil Fields.

●

MAX W. BALL (Consulting Geologist, Detroit, Mich.).

Steps in the Formation of an Oil Field.

The work of E. Berl and his associates has shown that in the presence of mineral substances with an alkaline reaction organic material is transformed by heat and pressure into what Dr. Berl calls a "protoproduct," this into asphalt, asphalt into asphaltic oils, these into mixed-base oils, these into paraffinic oils, and these into lighter and lighter gases until the final product is fixed dry gas. This sequence of formation may explain why gas only is found in regions where folding has been intense, and why the older oils are in general more paraffinic, the younger oils more asphaltic. Exceptions can probably be explained by differences in source material, in the alkaline reactions of the containing beds, and in the degree to which the containing beds have yielded to pressure and thus transferred part of the pressure to the contained organic material.

Some of the stages in the sequence can be observed at various places: The "kerogen" of the oil shales, the asphalt seeps of the Uinta basin, the oil just past the asphalt stage in the Athabaska oil sands, and the various oils and gases of the producing fields. If the Athabaska oil sands represent a typical stage, they may throw some light on the stage at which migration and accumulation take place. The oil is a film around each grain of sand, and is too viscous to migrate. The containing sand is unconsolidated, except for the binding effect of the oil, and has never been folded. Moderate abrasion of the sand grains releases the oil films, and moderate heat transforms the oil into lighter, more fluid oil. If the oil sands

were still deeply buried and if folding took place, the readjustment of the sand grains would furnish the necessary abrasion to free the films, the heat and pressure incident to the folding would transform the oil, and fluid movements would be set up leading to migration and to accumulation in whatever trap might be handy. This suggests that the transformation of organic material may proceed to and somewhat beyond the asphalt stage and the resulting material be moved out of the source beds before folding takes place, but that migration through the reservoir bed into traps does not take place until further heat, pressure, abrasion, and fluid movements are created by folding.

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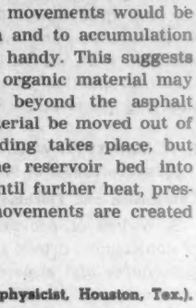
W. P. JENNY (Consulting Geophysicist, Houston, Tex.).

Geological Problems in the Interpretation of the Earth's Major Regional and Local Anomalies.



Magnetic anomalies are of various orders of magnitude. The largest may be called "continental," (Europe, negative; North and South America, positive) "regional" (West Texas or Transylvania, negative; California Valley or Wallachia, positive) and "local." Within the area of local anomalies there may be intralocal anomalies.

Major anomalies show interesting trends, such as a positive major trend paralleling the Rockies and the Andes and a negative major trend paralleling the Alpine chains.

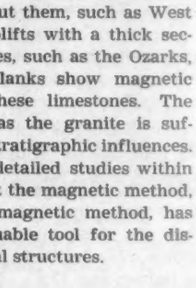
Regional anomalies disclose the tectonics, the stratigraphic and the petrographic character of the upper portion of the rock zone. A basin with strongly magnetic beds, such as Illinois, will be positive, whereas one without them, such as West Texas, will be negative. Uplifts with a thick section of Ordovician limestones, such as the Ozarks, will be negative as the flanks show magnetic shales and sands above these limestones. The Nemaha ridge is positive as the granite is sufficiently close to outweigh stratigraphic influences.

Local anomalies lead to detailed studies within the uppermost layers so that the magnetic method, and particularly the micromagnetic method, has developed into a most valuable tool for the discovery and outlining of local structures.

●

W. H. TWENHOFEL (University of Wisconsin, Madison).

The Sediments of Lakes.



Considerable has been written relating to the sediments of lakes of which most has been based on opinions of what lake sediments should be like and very little on actual examination of the sediments of lakes. Until about 15 years ago there had been no serious studies of the sediments on the bottom of any lake of North America, since which time studies have been largely confined to lakes in the glaciated regions. Shore deposits grade outward with decrease in size range and increase in organic content if such is possible. At some depth which evidently varies with every lake, but generally seems to be in the range from about 5 to about 8 meters, the sediments of the bottom become a black soupy material, generally termed sludge, which is very fine-grained and very rich in organic matter. Lakes receiving waters that contain much calcium carbonate have considerable parts of the sludge composed of this salt. If entering waters contain little suspended matter, the sludge may be expected to have a large content of diatom tests.

The sludge creates an environment favoring intense organic activity. It is inhabited by few kinds of macroscopic organisms. The most common seem to be worms which as observed in sludge in the laboratory, move up and down and thoroughly mix additions from above with the sludge already deposited. This mixing precludes any possibility of detailed stratification in deposits produced by compaction of sludge.

The sludge is generally inhabited by bacteria in countless numbers. These are there because of the organic matter which serves as food supply and may ultimately be eliminated. If destruction is carried to completion in a hard-water lake receiving few suspended sediments, the resulting deposits are dominantly composed of calcium carbonate. The sludge of a soft-water lake receiving few suspended sediments becomes transformed into a deposit which may be nearly pure diatomite. Most, if not all, sludge carries a considerable oil content. These oils under conditions of retardation or arrest of bacterial activity are not destroyed and then may be considered a source of petroleum.

R. W. RICHARDS

P. E. FITZGERALD

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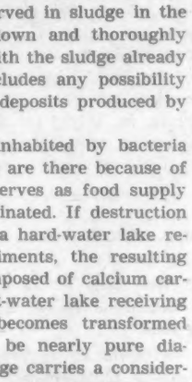
EUGENE McDERMOTT (Geophysical Service, Inc., Dallas, Tex.).

Geochemical Exploration (Soil Analysis) With Some Speculation as to the Genesis of Oil and Gas Accumulations.



The newly developed methods of geochemical exploration will undoubtedly play an important role in exploration for oil and gas fields. There has been a tendency in this country among the explorers for oil and gas to undervalue the role of surface evidences of such deposits. Most of the great oil fields of the world have been indicated by surface evidences. In view of the prevalence of visible oil and gas seeps, it is reasonable to expect to find microscopic seeps in much greater abundance. In practically all cases maximum leakage occurs from the edges of accumulations. These leaking gases are adsorbed by the earth particles near the surface and are then polymerized to the heavier hydrocarbons. The gases in leaking to the surface transport quantities of subsurface waters and the dissolved minerals, resulting in many cases in high mineral concentrations near the surface.

The data of geochemistry have led to some very interesting speculations regarding the genesis of oil and gas fields. Evidence strongly suggests that oil and gas fields result from the polymerization of the migrating hydrocarbon gases. Two sources of such gases have been measured, namely, vegetable matter that is being devolatilized and the basement rocks. There may, of course, be others as yet unmeasured. The important consideration is that so far as migration is concerned the gases are the principal participants.

It is believed that the oil accumulations and the concentrations of adsorbed hydrocarbons in the soil and in oil shales are genetically related. As the principal difference between marine and nonmarine sediments is the presence of sodium chloride (not organic content according to Trask), and as this will act as a catalytic agent to polymerize the hydrocarbon gases, it is reasonable to suppose that this is why oil fields occur in marine rather than nonmarine sediments. Experimental laboratory investigation verifies this.

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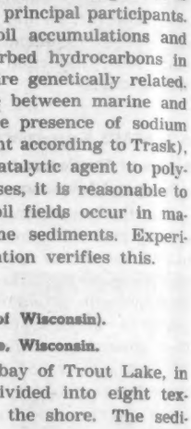
V. E. McKELVEY (University of Wisconsin).

Beach Sediments of Trout Lake, Wisconsin.



The beach deposits in a bay of Trout Lake, in northern Wisconsin, are divided into eight textural zones which parallel the shore. The sediments of these zones are described and compared with each other, using data derived from 103 mechanical analyses. Samples collected at the same points on the beach, and others collected at points of equal distance from the water's edge, are compared to show textural changes taking place on the beach. The accuracy of sampling is demonstrated by eight sets of four samples each, taken at the same time and place.

●

E. BERL (Carnegie Institute of Technology, Pittsburgh, Pa.).

The Role of Carbohydrates in the Formation of Oil and Bituminous Coals.

The author, with the help of very capable collaborators, has studied the conversion of carbohydrates and lignin derivatives. It has been found that lignin and its derivatives play a role only in the formation of lignites. Oil and bituminous coals are formed mostly from the carbohydrate content of plant materials. It has been found that the conversion of alges into the so-called "protoproduct" can be carried out very easily in the presence of alkaline reacting material like limestone. Ammonia formed during the decomposition from albumens acts like limestone. By further removal of oxygen by the process of intermolecular combustion or by hydrogenation, for instance in presence of bi-valent iron, materials containing less oxygen with asphalt-like properties are obtained. Further removal of oxygen by cracking or hydrogenation leads to oxygen-free hydrocarbons in which aliphatic, hydroaromatic, and aromatic hydrocarbons can be found. During this conversion methane and its homologues are formed.

Experiments have shown that alges and other carbohydrate-containing materials and the so-called protoproduct react with gypsum under formation of calcium sulfide which upon hydrolysis forms lime and hydrogen sulfide. Lime furnishes the necessary alkaline reaction for the conversion of carbohydrate material into its conversion products. Hydrogen sulfide acts as a hydrogenating agent with formation of sulfur.

Society Economic Paleontologists And Mineralogists

(Continued from Page 42)

Worth, and later another section developed on the Pacific Coast, at Los Angeles. Fall meetings for field trips were organized, one in 1927 in the vicinity of Fort Worth, and another in 1928 in northeastern Kansas, near Lawrence. The second annual meeting was held in conjunction with the A.A.P.G. at San Francisco. A program of 15 paleontologic papers was given. The officers selected for the second year were Raymond C. Moore, Lawrence, president; G. Dallas Hanna, San Francisco, vice president; F. B. Plummer, Fort Worth, secretary-treasurer; and Joseph A. Cushman, Sharon, Mass., editor.

The A.A.P.G. was greatly interested in developments along paleontologic lines. The officers of the association invited the newly chosen executive committee of the society to meet with them for the purpose of discussing future relations. The suggestion was made that the society be designated as a technical section of the association and thus constitute a division of that organization, rather than an entirely separate society bearing merely affiliate relations. This was to be investigated further.

The third annual meeting was held at Fort Worth, Tex., along with the association meeting. A vote was taken to authorize preparation of a petition from the society to be designated as a section or division of the American Association of Petroleum Geologists. At this meeting four distinguished contributors to paleontology and stratigraphy were chosen for honorary membership: Carlos Burckhardt, of the Geological Survey of New Mexico; Charles Schuchert, of Yale University; J. Perrin Smith, of Leland Stanford Junior University; and J. A. Udden, long director of the Bureau of Economic Geology, University of Texas. New officers chosen were: Marcus A. Hanna, Houston, president; John B. Reeside, Jr., Washington, vice president; F. B. Plummer, Fort Worth, secretary-treasurer; and Joseph A. Cushman, Sharon, editor. A fall field meeting of the society was held in 1929 in the vicinity of Austin, Tex.

A formal petition from the society was presented to the association at the New Orleans meeting March 1930, calling for establishment of the S.E.P.M. as a section of the A.A.P.G. It was approved at the annual business meeting of the association. Officers chosen were Joseph A. Cushman, Sharon, Mass., president; C. C. Church, San Francisco, vice president; Gayle Scott, Fort Worth, secretary-treasurer; Raymond C. Moore, Lawrence, editor.

During following years the chief developments in the society were along the line of efforts to collaborate with the Paleontologic Society, a much older organization that is affiliated with the Geological Society of America, in a plan to enlarge the Journal of Paleontology by joint publication. Finally, the Journal of Sedimentary Petrology, second official publication of the society, was begun in 1931, and edited by Raymond C. Moore, Lawrence, until 1933, when W. H. Twenhofel, Madison, was appointed associate editor.

From the third annual meeting at Fort Worth to the tenth at Tulsa in 1936, the following men served as presidents and vice presidents: In 1931 Charles E. Decker, Norman, Okla., was elected president; followed by G. Dallas Hanna, San Francisco; F. B. Plummer, Austin; N. L. Thomas, Fort Worth; W. H. Twenhofel, Madison; and Merle C. Israelsky, Houston. Vice president for 1931 was Walter S. Adkins, Houston, succeeded by James Waters, Dallas; H. G. Schenck, Stanford University, Calif.; Merle Israelsky, Houston; U. S. Grant, Los Angeles; and R. W. Harris, Norman. Gayle Scott, Fort Worth, was secretary-treasurer from 1930 through 1936, and Raymond C. Moore, Lawrence, served as editor from 1930 through 1938.

It was decided to change the method of election of national officers from a vote at the annual meeting to mailed balloting, and at the eleventh annual meeting in Los Angeles, March 1937, the new constitution was accepted. Officers elected were Stanley C. Wissler, Compton, Calif., president; F. W. Rolshausen, Houston, vice president; H. V. Howe, Baton Rouge, secretary-treasurer; and Raymond C. Moore, Lawrence, editor. F. B. Plummer of the University of Texas was elected to honorary membership in the S.E.P.M., joining Dr. R. T. Hill and Dr. Junius Henderson who had been thus honored in 1932 and 1933. During 1937 the society's business headquarters were shifted to the American Association of Petroleum Geologists' headquarters at Tulsa.

At the twelfth annual meeting at New Orleans, March 1938, new officers elected were E. H. Sellards, Austin, president; Paul P. Goudkoff, Los Angeles, vice president; Henry V. Howe, Louisiana State University, secretary-treasurer; and Raymond C. Moore, Lawrence, editor. They were succeeded in 1939 by Gayle Scott, Fort Worth, president; Herschel L. Driver, Glendale, vice president; Henry B. Stenzel, Austin, secretary-treasurer; and Norman D. Newell, Madison, editor.

By the end of 1939 membership in the S.E.P.M. had increased from the 80 charter members of its first year to 239 active and 79 associate members.

Dedicate Geology-Geophysics Building At Colorado School of Mines

Climaxing the Engineer's Day program recently at the Colorado School of Mines was the dedication of the recently completed Geology-Geophysics Building. The featured speaker of the day, Dr. E. L. DeGolyer, geologist and geophysicist of Dallas, Tex., gave the dedicatory address in which he surveyed the development of the two sciences, geology and geophysics, and discussed particularly their application to the present.

Analyses Present Evidence on Origin of Petroleum

(Continued from Page 46)

to speculate on possible practical results to be obtained. It is already known that there are families of closely associated oils occurring on definite trends. Two oils which lie on a line parallel to this trend and which are similar to one another and different from those in the trend may point to the existence of a parallel series of pools. Variations in the oil within a pool may lead to the determination of water levels if it is found that there is a tendency to increasing naphthenicity or paraffinicity resulting from reactions between the oil and edge water. Sharp variations within pools show the presence of impermeable sections preventing migration and intermixing. This, in turn, will throw light on well-spacing problems, or on repressuring and flooding programs.

What is mainly needed to bring this research project to a successful conclusion is the accumulation of data in the form of thousands of analyses of oils whose stratigraphic location is definitely known. With this material in hand, it may be possible to determine whether or not a single generalization can be drawn concerning the origin and migration of oil or whether conditions will be found to vary in different localities and at different times. The effect of metallic constituents and of sulfur will also have to be studied.

The whole problem is typical of the most valuable and fascinating kind of research, namely the discovery and interretation of facts, regardless of the effect of those facts on existing theories.

At this stage of the proceedings, the committee is unable to predict which theories will be affected, but it can definitely be said that the program has gone sufficiently far to promise results of great theoretical and practical value.

Headquarters Office of the A.A.P.G.

Through this staff at the Tulsa business office of the association clear the various and ramified records and activities of the association. In the usual order the women are: Miss Johnnie Ruth Cassidy, Miss Condray Blair, Miss Winona Rawlins, Miss Gayle Robertson and Miss Maree Cummings

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ABSTRACTS... of Papers

Society of Economic Paleontologists and Mineralogists

GAYLE SCOTT.

Paleoecological Factors Controlling the Distribution and Mode of Life of Cretaceous Ammonoids in the Texas Area.

This paper touches upon the growing importance of paleoecology. The classification of marine environments now in vogue with biologists is briefly reviewed and modified for geological and paleontological purposes. Two classifications are recognized. The habitat classification (pelagic, planktonic, nectonic, necto-benthonic, benthonic) is used without reference to depth of water involved. It is concluded that most or all shelled cephalopods were mobile benthonic and necto-benthonic. The bathymetric classification refers to depth of bottom. Divisions recognized are: (1) Littoral, (2) neritic [(*a*) mud flat, (*b*) reef, (*c*) epineritic, (*d*) infraneritic], (3) bathyal [(*a*) epibathyal, (*b*) infrabathyal], (4) abyssal.

It is suggested that the more obvious factors controlling ammonoid distribution may be interpreted in terms of morphology of shell, habits and distribution of living cephalopods, associated fossil faunas, types of sediments, paleogeography, bottom, and factors of the water medium such as salinity, temperature, depth, oxygen content, waves, currents. Flotation of shells after death of the animal probably occurred, but was much less important as a factor of distribution than is commonly supposed.

On the basis of shell morphology the principal Cretaceous ammonoid groups recognized are: (1) Smooth, involute, obese (Phylloceras); (2) smooth, evolute, obese (Lytoceras); (3) smooth, ovate (Desmoceras); (4) sculptured, ovate to quadrate, [(*a*) medium sculpture (Dufrenoya), (*b*) robust sculpture (Mortoniceras), (*c*) obese, spinose (Neocardioceras)] (5) tenuous, involute, lightly sculptured (Oxytropidoceras); (6) tenuous, involute, smooth (Engonoceras); (7) uncoiled types (several subdivisions, Turrilites, Hamites, etc.).

It is noted that ammonoids do not occur in littoral, mud flat, or reef deposits, and are rare with Orbitolina, rudistids and corals. Only the tenuous ammonoids (Engonoceras, Oxytropidoceras) are numerous with the abundant echinoids, oysters, and thick shelled gastropods and pelecypods of the epineritic zone. Sculptured forms of great variety and abundance occur in sediments deposited in the infraneritic zone (estimated at depths of 20-100 fathoms). Smooth, ovate genera (Desmoceras) lived in the epibathyal zone at or just below 100 fathoms. Smooth, obese genera (Phylloceras, Lytoceras and related forms) are found to the exclusion of other fossils in sediments of the infrabathyal zone. The Texas Cretaceous seas were too shallow to accommodate these types.

●

JOHN R. BALL (Northwestern University, Evanston, Ill.).

Some Silurian Correlations in the Lower Mississippi Drainage Basin.

The area discussed lies in the bluffs and adjacent uplands of the Mississippi River Valley region, and along some of the major tributaries of the Mississippi River. Certain persistent characteristics of lithology in the Silurian rocks prevail through the area. In western Tennessee, Southeast Ohio, southern Illinois, Southeast Missouri, Northeast Arkansas, and in the Arbuckle Mountains, a part of the Niagaran section is marked by the reddish, mottled, argillaceous facies in rocks where the megafossils are poorly preserved and somewhat rare. The red shales, clays and limestones of the Dixon formation in western Tennessee seem fairly typical of variegated beds of Niagaran age elsewhere in the area.

Correlations in some detail may be made between the reddish rocks of Southeast Missouri and other Niagaran units especially in western Tennessee. The correlations suggested are established in part on lithologic features and on other data of physical characteristics. Some interesting faunal similarities involving great distances are mentioned, and some striking faunal dissimilarities within short ranges are stressed.

●

W. FARRIN HOOVER (Consulting Geologist, Mount Vernon, Ill.).

A Correlation of the Subsurface Devonian of Sandoval Illinois Pool With the Devonian Outcrop in Southwest Illinois.

The study of cores and samples from various Devonian wells in the Sandoval area shows four distinct zones to be present in the area. The silty and sandy zone immediately above the Devonian limestone is thought to represent the Hardin sand of Kentucky and Tennessee; the top of the Devonian limestone including the oolite bed is a probable correlation of the Lingle; the sandy glauconitic, chloritic (Green Spot) limestone is suggestive of the Meisenheimer; the white crystalline fossiliferous limestone immediately above the pay section is thought to represent the Grand Tower limestone. The pay section occurs either in the basal portion of the Grand Tower, or in the Dutch Creek sandstone, or both.

●

R. L. CLIFTON (Champlin Refining Co., Enid, Okla.).

Invertebrate Faunas From the Blaine and the Dog Creek Formations of the Leonard Series.

Certain dolomites and limestones associated with massive gypsums in the Blaine and in the Dog Creek formations are fossiliferous of a new species. From one of such beds in the Blaine, *Perrinites gouldii*, Plummer and Scott, has been collected at three localities in Oklahoma. This ammonite has also been collected from three or more localities, from the same member of the Blaine, in Texas. Species of other orders and other ammonities are usually associated with *P. gouldii*.

Fossil collections from the Guthrie member of the younger Dog Creek formation include five species of pelecypods, single representatives of five other orders, and six cephalopods, among which is the ammonite *P. hilli*, Smith, and another ammonite, very similar in type to *P. gouldii*, Plummer and Scott. *P. hilli* has been collected at three localities, of the Guthrie in Texas.

●

THOMAS G. PAYNE (University of Chicago).

Recurrent Facies and Faunules of the New York Middle Devonian.

The Middle Devonian strata of central and western New York are characterized by the frequent recurrence of three distinct lithologic and faunal facies: (1) Coraliferous, crinoidal, organic limestone (Onondaga facies); (2) dark grey to black shale with a small but distinctive fauna (Marcellus facies); (3) fossiliferous, grey shale characterized by the recurrence of certain faunules and containing concretionary and thin lenticular limestone horizons (Wanakah facies). The origin of, and the environmental conditions believed to be represented by, these facies are outlined. The concretionary and lenticular limestone horizons probably represent relatively long periods of nondeposition of clastic materials.

Two distinct coral assemblages are described, and the environmental conditions believed to have been required by each are outlined. These assemblages bear strong ecological relationships to the three recurrent facies. Reasons are cited for the presence in the Hamilton beds of biostromes rather than the reef structures (bioherms) common to the Hamilton (Traverse) of Michigan. Recurrences in the Hamilton shales of beds of Onondaga facies may represent abortive attempts at reef construction.

●

WILLIAM F. READ (University of Chicago, Chicago).

Association of West Texas Permian Vertebrates and Plants With Marine Invertebrates.

In 1938, a University of Chicago field party, under the direction of Dr. Everett C. Olson, discovered Permian vertebrates and plants in close stratigraphic proximity to a marine limestone with numerous invertebrates. This Baylor County locality was mapped the following summer, and samples were taken for sedimentological analysis. The unique association of plants, vertebrates, and invertebrates promises to yield a valuable correlation between the marine and nonmarine, plant and animal records. The study of the sediments also throws light on the environmental conditions.

●

HAROLD B. RENFRO (University of Wisconsin).

Pelecypod Fauna of the Permian Satanka Shale.

A Pelecypod fauna from the Satanka shale of southeastern Wyoming is compared with similar forms from the Phosphoria formation of western Wyoming, and the Kaibab limestone of Arizona.

●

R. HENDEE SMITH (Louisiana State University).

Micropaleontology and Stratigraphy of a Deep Well at Niceville, Okaloosa County, Florida.

In the type area of the Florida upper and middle Miocene section there is still considerable doubt as to the thickness and dip of the beds and the ranges of many of the microfossils. Drilling of a water well in the southern part of Okaloosa County has made it possible to establish some strike and dip control of the formations in

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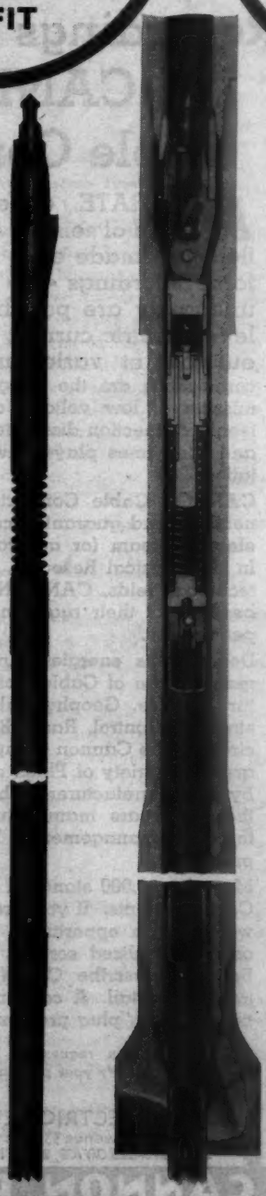

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addition to first occurrences of some typical forms in the column. It serves as a useful point of departure for correlation of wells in other parts of the Gulf Coast, as it aids in establishing the relative position of points on the "paleontological time scale," which previously was known only from inferential evidence.

●

ALFRED FISCHER (University of Wisconsin).

A Belemnite From the Permian of Greenland.

Collections of Permian fossils obtained in east Greenland by the Danish expeditions under Lauge Koch contain specimens of a remarkably well preserved belemnite, probably the first undoubted Paleozoic form. The material came from the *Posidonomya* beds associated with a fish fauna of mid-Permian affinities, beneath limestones containing *Productids* and *Cyclolobus*. The belemnites were obtained at three separate localities in east Greenland: Clavering Island, Gauss Peninsula, and the Giesecke Mountains. The rostra show well-preserved internal structures and ornamentation. Arm hooks and incomplete phragmocones are well represented. There appears to be one species, referable to a new genus. It shows affinities with the Triassic Aulacoceratidae, but is distinct from described genera.

●

HELEN TAPPAN LOEBLICH (University of Chicago).

New Arenaceous Foraminifera From the Woodbine Sand of Northern Texas.

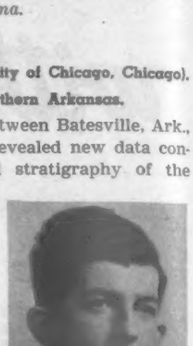
During the course of work on the foraminifera of the Washita group (uppermost Lower Cretaceous) in northern Texas, samples were also collected from the overlying Upper Cretaceous Woodbine sand wherever shaly strata were seen. One of these microsamples, from the northeastern part of Denison, in Grayson County, Texas, contains numerous specimens of two large new species of *Flabellammina* and a new species of *Reophax*. Polymorphism is well shown by the individuals of *Flabellammina*.

●

WILLIAM H. EASTON (University of Chicago, Chicago).

Midcarboniferous Strata of Northern Arkansas.

Field work in the area between Batesville, Ark., and Muskogee, Okla., has revealed new data concerning the structure and stratigraphy of the Boston Mountains. The Pitkin limestone (locally uppermost Chester) is extremely variable in thickness over short distances, but thickens markedly to the southeast from Harrison, Ark. The lower Pennsylvanian Hale and Bloyd formations apparently increase in thickness just east of the Arkansas-Oklahoma line, but toward the east end of the Boston Mountains, where the Pitkin thickens greatly, these lower Morrow beds thin out and may be absent. A zone of faults with some measured displacements of over 400 ft. occurs south of the Boston Mountain escarpment. Structures associated with this faulting possibly have provided reservoirs suitable for the accumulation of hydrocarbons.



●

HUBERT G. SCHENCK (Stanford University).

Economically Important Microfossils.

This paper presents an analysis of the answers to a questionnaire sent to a large number of paleontologists throughout the world. They were requested to rate, in order of importance, several categories of microfossils. "Importance" was construed as "value of these microfossils used in daily routine work as indicators of environment and of chronology." Ninety-eight replies, which constitute an adequate sample, serve as the basis of a statistical analysis. Foraminifera lead by a wide margin, followed by the Ostracoda, with the mollusca third. The relative ranking of the other categories will be shown on the chart.

●

NORMAN D. NEWELL (University of Wisconsin).

BERNARD KUMMEL (University of Wisconsin).

Permo-Triassic Boundary in Southeastern Idaho and Western Wyoming.

For some years there has been controversy regarding the age of the Dinwoody formation of western Wyoming, and the Woodside formation of southeastern Idaho, both of which directly overlie the mid-Permian Phosphoria formation. Preliminary study of Woodside and Dinwoody faunas indicates an early Triassic age for both formations.

N. D. NEWELL

●

NORMAN D. NEWELL (University of Wisconsin).

Phylogeny of Myalina S.S.

Among the large number of heterogeneous species of late Paleozoic pelecypods commonly classed as *Myalina* there is a remarkable series which illustrates "orthogenesis" in a most convincing way. Ontogeny of the youngest species faithfully recapitulates the phylogeny. This study reveals the high order of stratigraphic value of some late Paleozoic pelecypods.

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LLOYD WILLIAM STEPHENSON (U. S. Geological Survey).

Summary of Faunal Studies of the Navarro Group of Texas.

The Navarro group in East Central Texas is divided into four formations, in ascending order, Neylandville marl, Nacatoch sand, Corsicana marl, and Kemp clay. Fully 90 per cent of the Navarro fauna as at present known is restricted to the Navarro group and its equivalents. Only one species, *Gryphaeostrea vomer* (Morton), is known to range upward into sediments of Tertiary age.

The Neylandville marl has yielded about 100 specifically named forms; leaving the 30 long-ranging species out of consideration, only five of the remaining species range downward into the Taylor marl, whereas 33 species range upward into the Nacatoch sand. It is concluded that the fauna of the Neylandville is more closely related to that of the Navarro group above than it is to the fauna of the Taylor marl below, and justifies classifying the Neylandville with the Navarro.

The failure of practically all of the Navarro species, and 50 per cent or less of the genera, to appear in post-Navarro sediments is interpreted to indicate that a major geologic episode took place at the end of Cretaceous time. An uplift of the land or a lowering of sea level of sufficiently great magnitude to cause the strand line to retreat across the continental shelf to its relatively steep outer slope, thus restricting the area of sea bottom suitable for the shallower water organisms to a very narrow zone, and the consequent severe competition for space and food, is suggested as an adequate cause to explain the extinction of many organisms and the rapid evolutionary development of others.

The Navarro group is correlated with the Maestrichtian of Europe.

●

EDWARD A. FREDERICKSON (University of Wisconsin).

Cambro-Ordovician Trilobites From Oklahoma.

Well-preserved trilobites are abundant in limestone members of the lower one-fourth of the Arbuckle and Timbered Hills groups in the Arbuckle and Wichita Mountains, Oklahoma. Preliminary analysis reveals forms having affinities with Croixan and Beekmantown faunas. Stratigraphic divisions recognized in current classifications are characterized by distinct trilobite assemblages.

●

W. M. COGEN (Shell Oil Co., Inc., Houston, Tex.).

Heavy Mineral Zones of Louisiana Gulf Coast Sediments.

●

F. J. PETTIJOHN (University of Chicago).

Relative Abundance of Size-Grades of Clastic Sediments.

A statistical summary of about 1,000 published mechanical analyses of all kinds of clastic sediments shows that there is a deficiency of material in 4-2 mm. (granule) and 2-1 mm. (very coarse sand) range. A similar, though less well-proved, deficiency appears in the silt range.

Granules made up of two or three mineral grains are apparently less stable under ordinary conditions of transport than either pebbles or single mineral grains. This apparently accounts for the deficiency of granule sediments. The deficiency of silt is due to the greater quantity of sand (disintegration product) and clay (weathering or decomposition product). Neither disintegration nor decomposition yield silt in appreciable amounts.

●

M. L. THOMPSON (New Mexico School of Mines) and H. J. BISSELL.

Pennsylvanian and Permian Fusulinids of the Wasatch Mountains, Utah.

Over 100 collections of fusulinids from horizons scattered throughout over 20,000 ft. of Pennsylvanian and Permian strata in the southern Wasatch Mountains of Utah have yielded representatives of the following fusulinid genera: *Fusulinella, Fusulina, Triticites, Schwagerina and Pseudoschwagerina.* These fusulinids are described and illustrated in this paper. Our conclusions are that these collections represent strata equivalent in age to the Bend (Lampasas of Cheney), Strawn, Canyon, and Cisco series of the Pennsylvanian and the Wolfcamp series of the Permian in Texas.

●

L. G. HENBEST (U. S. Geological Survey) and S. A. BERTHIAUME.

Fusulinidae From the Crooked River Basin, Oregon.

●

E. C. DAPPLES (Northwestern University, Evanston, Ill.).

The Sedimentary Characteristics of the Lonsdale Limestone.

The Lonsdale varies considerably in thickness since it lies upon an unconformable surface, and where it thickens the bed becomes lithographic or earthy in texture and loses its mottled appearance. Commonly where the limestone lies upon a channel sandstone the limestone thickens as the sandstone thins. In such cases the limestone overlaps the sandstone and the lower fusulina-bearing layer of Lonsdale lenses out against the sandstone. The upper surface of the Lonsdale is also irregular due to erosion, and locally a conglomerate consisting of redeposited Lonsdale nodules appears in an overlying bed.

●

M. L. THOMPSON (New Mexico School of Mines) and J. C. HAZZARD.

Permian Fusulinids From the Providence Mountains, California.

Seventeen species of fusulinids are described and illustrated and the containing beds are correlated with Permian of other regions. The following fusulinid genera are represented: *Schubertella, Triticites, Schwagerina,* and *Pseudoschwagerina.* Direct comparisons are made with the Permian fusulinid faunas of Texas and Asia.

●

GEORGE H. OTTO and MELVIN N. LEVET.

Effect of Sieving Time and Sample Weight on the Statistics of Sieve Analyses of Quartz Sand.

Sieving time and sample weight were each systematically varied through a sixteenfold range for a series of quartz sands differing in average size from fine to very coarse and in sorting from highly to poorly sorted. A procedure was devised for varying sample weights twofold at a time so that any sampling errors unavoidably introduced could be eliminated mathematically. Contour maps of the phi arithmetic mean diameter and the phi standard deviation were then prepared to enable the effects on average size and sorting to be studied independently; the former were much the larger. The weight of the smallest sample employed in each series was adjusted according to the coarseness and sorting of the sand being analyzed; in this way, a high degree of similarity was obtained in all the contour patterns. Certain consistent changes in the direction of the contours on each map, together with some economic considerations, furnish a rational basis for selection of an efficient sample weight and sieving time for any sand.

●

BENJAMIN H. BURMA (University of Wisconsin).

Statistical Analysis Applied to Fusulinids.

During the past decade fusulinid biostratigraphy has undergone spectacular development. However, further refinement of study methods is now required for recognition of phylogenetic series of less than generic rank. Statistical methods used in recent studies have been improved in a study of Missourian fusulinids of Iowa. Some 15 well defined zones of Triticites now can be recognized in the Missouri series of the Pennsylvanian rocks in the northern Mid-Continent region.

●

GEORGE H. OTTO (U. S. Soil Conservation Service, Pasadena, Calif.).

Field Sampling Errors in Relation to Typical Beaches of Texas, Florida and California.

Five classes of field sampling errors are shown to exist, and their relative importance and order of magnitude are considered. In addition, two important causes of variation in composition, not properly included but frequently confused with field sampling errors, are discussed. Suites of samples taken from the beaches of Texas, Florida and California were analyzed mechanically and the resulting differences in average size, sorting and skewness were compared with laboratory errors and shown to be considerably greater in most cases. The composition differences within each suite are examined in the light of the preceding discussion and are used as illustrations. In certain cases, either because of the dominance of a single class of errors or because of the sampling plan, it is possible to estimate the magnitude of one or more of the sources of variation.

●

N. ALLEN RILEY (University of Chicago).

A Simplified Method of Studying the Shapes of Sedimentary Particles.

This study is an analysis of the relation between various methods of expressing shape (sphericity) quantitatively. Measurements of sphericity were made on outwash gravel, flat beach pebbles, and dune sand, by means of Wentworth's flatness ratio, Cox's "roundness," Wadell's volume and projection sphericity, and two new alternative methods. The new methods are based on projection measurements; they are rapid and practical for microscope use. Wadell's circle protractor is adapted for use in a microscope ocular, and its application to the thin section analysis of rock cores is discussed.

Ardmore Geological Society Election and Field Trip

The Ardmore Geological Society has elected the following officers for the ensuing year: President, W. M. Guthrey, Texas Co.; vice president, Paul L. Bartram, Phillips Petroleum Co.; secretary-treasurer, Tom L. Coleman, U. S. Geological Survey.

A field trip is planned May 4 and 5, led by Dr. C. W. Tomlinson, to study structure and formations contiguous to the new discovery by Pure Oil Co. near Madill, Okla.

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ABSTRACTS... of Papers

Society of Exploration Geophysicists

IRWIN ROMAN (Geological Survey, U. S. Department of the Interior).

The Evaluation of Magnetic Anomalies by Means of Scales.

The vertical magnetic intensity due to a uniformly magnetized body has been calculated by means of special scales. The method is discussed and the results given for a magnetic profile across the body, and for the effect of a receding base. Results for special cases in which theoretical formulas are available have compared satisfactorily with the measured values. The reproducibility of the readings is illustrated and the analog of the scales for the horizontal magnetic intensity is illustrated.

●

JAMES B. MACELWANE, S.J. (Director, Department of Geophysics, St. Louis University).

Fifteen Years of Geophysics: A Chapter in the Exploration of the United States, 1924-1939.

The progress and achievements of geophysical prospecting in the United States and Canada during the last 15 years is passed in brief review. Composite maps of the areas prospected by the various methods will be presented in lantern slides. A large number of commercial concerns cooperated with the author in making these maps possible by contributing data.

●

W. R. RANSONE and F. E. ROMBERG (Geophysical Service Incorporated).

Average Vertical Velocities From Refraction and Reflection Profiles.

This paper presents data from a combined refraction and reflection profile from which vertical seismic velocities are calculated. The value of the velocities so obtained is evaluated by checking them with velocities obtained from shooting a well drilled some years subsequent to the seismograph work. It is also interesting to note that this method offers a means of identifying reflection horizons with refracting horizons, enabling better correlation between geologic and seismic markers. The method is of particular value in areas where little exploration work has been done.

W. R. RANSONE

F. E. ROMBERG

W. M. RUST, JR. (Humble Oil & Refining Co.).

Electrical Prospecting Methods.

A brief summary is given of various electrical prospecting methods. Ten modifications, which are typical of the many possible variations of electrical methods, are described. The equipment and measurements are outlined and comments on their applicability to and success in mineral and petroleum exploration are given. Possible explanations of the more widespread acceptance of electrical methods in mineral prospecting than in petroleum prospecting are offered.

●

R. D. WYCKOFF (Gulf Research & Development Co.).

The Gulf Gravimeter.

The design features of the Gulf gravimeter are presented, accompanied by a brief discussion of general gravimeter-design problems. In addition to the description of the unastatized instrument which is the type finally selected for commercial development, brief consideration is given to two astatized instruments including a bifilar gravimeter the construction of which was carried to completion.

●

HERBERT HOOVER, JR. and E. E. HOSKINS (United Geophysical Co.).

Modern Seismic Amplifiers.

A brief resume of developments in amplifiers used in reflection prospecting. Modern trends in automatic gain control and frequency response, variable with time, are discussed. Amplifier-time constants and phase-shift requirements are given.

●

DR. R. THOMAS SANDERSON (Chief Chemist, Western Geophysical Co. of California).

Some Neglected Aspects of Chemical Exploration.

Some potential sources of difficulty inherent in the soil-analysis method of chemical exploration for petroleum are discussed in detail. These are as follows: First, the methods of analysis are open to doubt due to difficulties in the separation of the hydrocarbons from the soil. Second, the analytical data, once obtained, cannot readily be interpreted in terms of the soil-air hydrocarbons which they should represent for two closely interrelated reasons: (*a*) Differences in soil sorptive abilities, and (*b*) difference in conditions of sorption. Neither of these can be properly measured, evaluated, or corrected for, by present-known methods. The problem of correction is complicated, difficult, and perhaps insoluble. The earlier-known method of soil-gas analysis offers a way of avoiding soil difficulties, theoretically, and in practice, using newly developed techniques, it is creating considerable cause for optimism.

●

W. G. GREEN and R. E. FEARON (Well Surveys, Inc.).

Some Properties of Radioactivity Logs.

A discussion of the relation of radioactivity curves to physical properties of strata studied, including the influence of history of the rocks involved. Comparisons are made between the probable extensiveness of correlateable horizons in various types of formations, and the ability of various logging methods to distinguish these layers is considered as an index of the geological usefulness of the various logging methods. The possibility of distinguishing altered zones which do not show marked physical differences from the neighboring rocks (such as faults and unconformities) is discussed and its bearing on usefulness of radioactivity logging considered. Illustrations of correlating power of radioactivity logs are given. Comparisons with electrical curves and with geological sample logs are shown illustrating the points discussed. A brief discussion of the development of the radioactivity logging method, and of the technique of carrying out field operations is also given.

W. G. GREEN

R. E. FEARON

●

B. B. WEATHERBY (Geophysical Research Corp.).

The History and Development of Seismic Prospecting.

The paper reviews the development of the refraction and reflection methods of seismic prospecting. The refraction method has a historical background extending back to experiments in 1850 by the Irish physicist, Robert Mallet, but the method was not reduced to commercial practice until 1923 by a German company, the Seismos Gesellschaft. The reflection method dates back only to 1917 and was reduced to commercial practice by the Geophysical Research Corporation in 1927. The entire credit for the development of the seismic reflection method belongs to American experimenters and companies. The total cost of seismic exploration in this country has been somewhat less than $200,000,000, and the work has resulted in the discovery of at least 4,000,000,000 bbl. of oil.

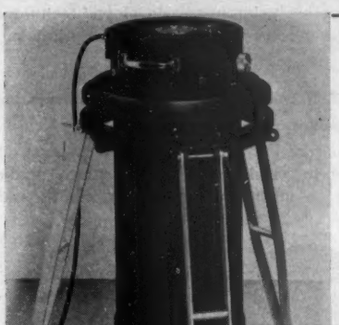
●

HAROLD WASHBURN and HAROLD WILEY (United Geophysical Co.).

The Effect of the Placement of a Seismometer on Its Response Characteristics.

A group of experiments were performed to determine the effect of the placement or plant of a seismometer on the motion imparted to it by

the ground. It was found experimentally that a seismometer and the ground form a resonant system. The characteristics of this system depend on the type and condition of the ground surface, the method of planting the seismometer and the seismometer weight and base area. Methods were devised for obtaining a satisfactory seismometer plant in areas where ordinary surface plants introduce distortion into seismic records. The mathematical expressions for seismometer response and ground admittance in terms of experimentally measurable quantities are given in the appendix.



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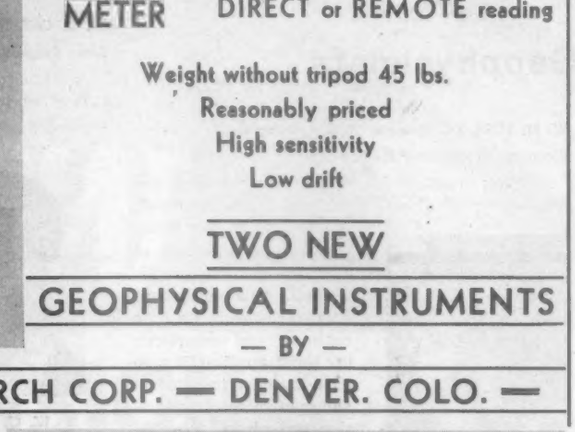


GRAVITY SURVEYS

Fifteen years experience in making and interpreting gravity surveys in the United States and foreign countries.

W. G. SAVILLE *J. P. SCHUMACHER* *A. G. PAGAN*

GRAVITY METER EXPLORATION CO.

TORSION BALANCE EXPLORATION CO.

830-2 Shell Bldg. Houston, Texas

E. D. LYNTON (Standard Oil Co. of California).

The Mechanics of the Upside-Down Core.

Very frequently cores taken from trays and oriented by the Herrick-Lynton method of magnetic core orientation have been wrongly marked as to top and bottom. If the bottom of the core is run as top, the resulting orientation is not 180° off unless the points of the compass are marked similarly to a Brunton compass, namely, transposition of East and West.

●

RAYMOND A. PETERSON (United Geophysical Co.).

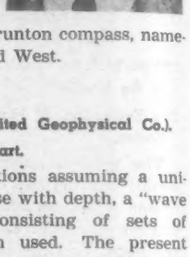
A Transformed Wave Front Chart.

In seismogragh computations assuming a uniform rate of velocity increase with depth, a "wave front-wave path" chart consisting of sets of orthogonal circles is often used. The present paper describes a transformation by which the wave fronts become a set of concentric circles with the wave paths as radii, while the cartesian coordinates representing vertical and horizontal distances in the ground become orthogonal circles.

●

E. A. ECKHARDT (Gulf Research & Development Co.).

A Brief History of the Gravity Method of Prospecting.



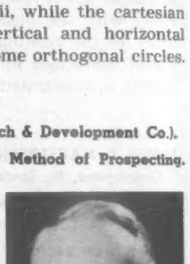
The history of gravity observations is reviewed with special reference to the geological implications of such measurements. The gradual transition is traced from the mere realization that gravity observations made for geodetic purposes reveal major tectonic features to the deliberate execution of gravity surveys as steps in prospecting.

●

W. T. BORN (Geophysical Research Corp.).

A Note on the Attenuation Constant of Earth Materials.

This paper discusses briefly the character of two types of losses, namely, viscous losses and solid friction losses, which may cause sound waves to be attenuated as they travel through a solid medium. Laboratory experiments on small rock samples indicate that solid friction losses are primarily responsible for the attenuation of seismic waves passing through earth materials, and yield a value for the attenuation constant which checks approximately with the attenuation constant derived from seismic reflection records. Frequency characteristics produced by earth attenuation are derived on the basis of this experimental work.



Geophysical Applications in the Production of Oil.

This paper comments briefly upon the importance of geophysical data and methods in solving problems concerned with the production of oil. Among the methods discussed are included electrical logging of uncased wells, thermometric surveys of both completed and uncompleted wells, the use of sound-reflection methods for determining the fluid level in producing wells, and the recently introduced method of logging formations behind casing in completed wells by recording

their relative radioactivity. Mention is made of current work on the possibility of logging formations by determining their acoustic properties.

●

J. M. KENDALL (Geophysical Research Corp.).

The Range of Amplitudes in Seismic Reflection Records.

Curves are presented which show the amplitudes of some reflection records plotted as a function of time, for several widely separated areas. It is shown that amplitude ratios of the order of 1000:1 occur on records in a time interval of 2 seconds. After correcting for divergence of the recorded waves, it is found that their amplitude decreases exponentially with time. On the assumption that the efficiency of dynamite is independent of the size of charge, an approximate relation is given which indicates the amount of explosive required to obtain seismic reflection records of different lengths under similar operating conditions.

●

S. S. WEST (Stanolind Oil & Gas Co.).

The Effect of Density on Seismic Reflections.

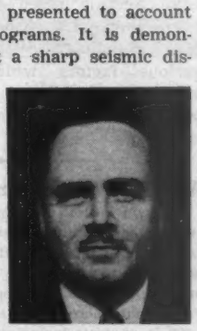
By means of existing data on the density of rocks, it is shown that reflection coefficients of seismic waves, calculated from velocities alone, often differ greatly from the actual values. Data on a large number of density discontinuities have been tabulated and the true reflection coefficients calculated for six cases where the velocities are also known.

●

NORMAN RICKER (Carter Oil Co.).

On the Form and Nature of Seismic Waves and the Structure of Seismograms.

In this paper a theory is presented to account for the structure of seismograms. It is demonstrated mathematically that a sharp seismic disturbance gives rise to a traveling "wavelet," of shape determined by the nature of the earth's absorption spectrum for elastic waves, and that a seismogram is composed of a succession of these wavelets, generally overlapping, but sometimes in the clear. It is further brought out that it is the center of the wavelet which travels with a velocity characteristic of the medium, and that the wavelet broadens as it moves along in accord with a definite law. Experimental support of the theory also is presented.



●

M. O. GIBSON (Shell Oil Co., Inc.).

Network Adjustment by Least Squares—Alternative Formulation and Solution by Iteration.

Given a network, as in a gravity survey, comprising observed differences in the values of adjacent points, any adjustment of the network, however obtained, is shown to be a least square adjustment if (1) the sum of the corrected observations around any circuit is zero. This principle provides a means of controlling necessary approximations such as the subdivision of a large network, and simplifies subsequent adjustments made necessary by extension or revision of the observations. It also serves in some cases to reduce the number of equations and in others to eliminate the equations entirely. The paper outlines a time-saving trial and error method of solving network equations, applicable to electric circuit as well as observational network problems.

●

ALFRED WOLF (Geophysical Research Corp.).

The Time Delay of a Wave Group in the Weathered Layer.

Ground motion observed in seismic prospecting can be regarded as being composed of groups of waves of some predominant frequency. The velocity of propagation of such wave groups in the earth is the group velocity. A detailed application is made to the calculation of the time delay of a reflection wave group passing through the weathered layer. It appears that weathering time is a function of the frequency of the reflection, and that it may differ from the weathering time calculated from the travel time of first arrival waves.

●

THOMAS A. ELKINS (Gulf Research & Development Co.).

The Reliability, on the Basis of Portability Considerations, of Geophysical Anomalies.

When data are used which contain random errors, there is always some question as to whether a supposed anomaly may not be real but due only to errors in the data. This paper describes a method of testing this point, which is worked out in detail assuming the Gaussian error law for the case of independent values. Possible applications of the method to the problems of contouring data, and evaluating and ranking anomalies are suggested. Examples of the use of

A Barret magnetic crew on the front lines in Mississippi.

Our first survey in Mississippi was carried out in 1932. It was successful. So are the ones we are working on today, eight years later.

●

MAGNETIC AND ELECTRIC SURVEYS

WILLIAM M. BARRET, INC.

Consulting Geophysicists

GIDDENS-LANE BLDG. SHREVEPORT, LA.

the method on gravimeter and soil analysis data are also given.

●

N. N. ZIRBEL (Independent Exploration Co.).

Michigan Weathering.

In this paper weathering conditions found in the Michigan basin are discussed. It is shown that the depth of the drift cannot generally be determined from weathering profiles and a method for correcting reflection depths under these conditions suggested.

●

HAROLD WASHBURN and RAYMOND C. OLESON (United Geophysical Co.).

Transient Testing of Seismic Recording Apparatus.

A brief description of the major elements of a complete system for use in testing the response of a complete seismic recording system, or any single unit of the system, to transient waves.

●

SYLVAIN J. PIRSON (Pennsylvania State College).

A Critical Survey of Recent Developments in Geochemical Prospecting.

The historical background of geochemical prospecting is briefly reviewed. The principle methods and theories of the art are critically surveyed.

and the relative merits of the two principal procedures, namely, soil sampling, and soil gas sampling are discussed. A number of objections to the soil sampling method are pointed out and it is suggested that soil gas sampling may be the preferable method when proper technique is employed. The results of two soil analysis surveys in New York State are presented.

●

ROLAND F. BEERS (The Geotechnical Corp.).

Resolution Control in Seismic Surveys.

Development of the concept of velocity stratification by experimental means has revealed the origin of certain reflection horizons. Correlation of these data with subsurface lithology suggests a method of attack, employing seismic means, on the problem of the stratigraphic trap. This paper outlines the problem and describes a method whereby stratigraphic relationships may be measured. It is suggested that a seismic wave may be fitted to the task of altering its wave length in accordance with the degree of resolution desired. Experimental examples of the procedure are given.

●

THOMAS WIANCKO and MARTIN EICHELBERGER (United Geophysical Co.).

Combination of Wave Transients.

Two groups of wave transients, of varying amplitudes and phases, are added together to form composite wave transients. Photographic records of the composite transients are shown which may be compared with field seismograms, and the case of superposition of two reflections of different "movements" may be studied.

●

H. J. McCREADY (Mott-Smith Corp.).

Shot-Hole Characteristics in Reflection Seismology.

A discussion is presented of the differences in the behavior of shot holes in various materials. It is found that an increasing delay is shown in the records of reflections on successive shots fired in the same hole. Suggestions are made for dealing with such delay in computation of records. Record character is shown to be a function of the nature of the material in the shot hole. High frequencies are associated with hard materials, low frequencies with plastic formations.

●

M. B. WIDESS and N. A. HASKELL (Western Geophysical Co.).

The Computation and Mapping of Seismic Reflection Data.

M. B. WIDESS

N. A. HASKELL

The fundamental computation equations for dip shooting are reviewed. From a consideration of the curvature of the wave front of the reflected wave an expression is derived from the angle of arrival in terms of the reflection time difference over a finite spread. The effect of curvature of the reflecting bed is discussed. An outline is given of a rigorous computational procedure which takes full consideration of the three dimensional aspects of seismic interpretation and which is based on the use of time cross-sections and maps. Since this procedure is presented on the basis of a velocity equation which is a function only of depth, it is indicated that a modification must often be made to account for the deviation of the direction of velocity gradient from the vertical.

●

E. E. ROSAIRE (Subterrex).

A Perspective of Exploration for Petroleum.

The first petroleum prospecting technique, based on the recognition of visible seeps of oil and gas, was rational and direct. Its exhaustive application led to diminishing returns, and a period of rule-o'-thumb prospecting ensued. The exhaustive application of structural prospecting by geological methods led to the discovery of many oil fields, but, eventually, diminishing returns ensued. Geophysical prospecting appeared on the scene in 1923, and was successful in the solution of a highly specialized problem, without, however, relying upon depth estimations. Gradually geophysical prospecting took on a structural complexion, and with the development of the reflection seismograph a rennaissance in structural prospecting took place.

Though tacitly neglected in the past, there exists a geochemistry of a petroleum deposit, depending primarily upon the slow leakage over geologic time, of hydrocarbons through the sedimentary environment of the petroleum deposit. Geochemical prospecting, then, depends upon the geophysical measurement of geochemical manifestations of a petroleum deposit, and the interpretation of the resulting data in terms of the local geology.

●

T. B. PEPPER (Gulf Research & Development Co.).

The Gulf Underwater Gravimeter.

A brief description of the Gulf underwater gravimeter is presented showing the salient design features whereby a regular Gulf gravimeter is incorporated in a device permitting precision gravity measurements in coastal waters several hundred feet in depth.

The instrument is adapted to be lowered to bottom on a cable and through remote-control devices all necessary adjustments are made from the surface. The reading is obtained photographically on a continuously moving film which permits accurate observations even when moderate seismic disturbances cause oscillation of the index point.

●

M. W. GAY (Gulf Research & Development Co.).

Relative Gravity Measurements Using Precision Pendulum Equipment.

The precision with which relative gravity values may be obtained by the use of suitable pendulum equipment is illustrated by actual data obtained in establishing calibration stations used to facilitate the calibration of gravimeters.

A resume of the operating technique together with the salient features of the Gulf pendulum equipment is given in connection with a tabulated summary of the various factors which must be considered in designing and operating pendulums in order to attain the desired precision of 10^{-7} g.

A.A.P.G. Post-Convention Trips

Post-convention trip No. 1, Saturday, April 13, will provide opportunity to examine La Salle anticline in its type locality along Illinois River Valley near La Salle, where asymmetric character of fold and two major periods of folding are well known. Illinois Valley cuts across the structure and exposes about 1,000 ft. of strata including Shakopee, St. Peter, Decorah and Galena of Ordovician age; and Pottsville, Carbondale, and McLeansboro strata of Pennsylvanian age. St. Peter sand will be examined at Starved Rock and Horseshoe Canyon. Party will examine many physiographic features provided by glacial flood waters during Wisconsin glacial stage, including large gravel delta deposited in Lake Illinois. Leaders will be H. B. Willman and J. M. Weller.

Post-convention trip No. 2, Saturday, April 13, will feature the "Kentland uplift" and Silurian coral reefs of northern Indiana. The Kentland quarry exhibits disturbed Ordovician rocks—uplift of 1,500 ft. Pennsylvanian-Devonian contact will be seen near Remington, Ind.; quarry at Monon shows core of "reef" in Huntington (Silurian dolomite saturated with oil); at Delphi will be seen an inlier of Huntington dolomite surrounded by steeply dipping Devonian limestone and shale (probably coral reef hill); type reef structure of region is shown in completely exposed cross-section at Wabash. Leaders will be R. E. Esarey and C. A. Malott.

Pipe-laying operations have been accelerated by utilisation of modern, efficient equipment which facilitates the handling of pipe quickly and accurately. In laying across streams, conditions are encountered which require considerable manual labor in addition to mechanical equipment. This view shows work done by Sheehan Pipe Line Construction Co. on a Socony-Vacuum line serving as an outlet for the Illinois basin

ENGINEERING & OPERATION

APRIL 11, 1940

Acidizing crew awaiting instructions before treating well in southern Illinois

The pays in the thick limestone series of Southern Illinois differ in composition, porosity and permeability. This article deals with the various ways of treating each formation and types of acid used

Acidizing Illinois Limestones Presents Many Problems

By W. W. LOVE
Dowell, Inc., Salem, Ill.

ACIDIZING has been practiced to some extent in Illinois since the inception of the process; however, this discussion relates principally to acidizing since the discovery of the Clay City pool of Clay County in March 1937.[1] Since then the development has continued at a rapid pace. Numerous new pools or new horizons in old pools have been discovered at widely separated points throughout the southern half of the state. Exploration of new areas is being carried on at a steadily increasing rate and it is probable that additional new fields will yet be discovered.

The general structure of southern Illinois is that of a synclinal basin having its longest axis in a north-south direction and its general outline apparently related to the trends of the individual pools and also to the trends of various groups of pools. The longest dimension of the individual pools is commonly in a north-south direction as are the trend lines of the groups of pools.

The oil-producing formations in the Illinois basin range in age from Ordovician to Pennsylvanian and while the number of separate producing horizons are approximately 40, only about 5 of these are of importance so far as acidizing is concerned. These are the Ste. Genevieve, St. Louis and Salem formations of lower Mississippian age; the Devonian limestone and the Trenton limestone of Ordovician age. It is common for two or more formations to produce in a single field and any of the older ones may be considered potential limestone-producing zones until they are proved otherwise. Fig. 1 shows a generalized vertical geological section at Salem with the relative positions of the producing limestone formations and their approximate thicknesses.

The formations of most interest from an acidizing standpoint all lie below the Pennsylvanian and with very few exceptions below the Chester series.

The Trenton[2] (Kimmswick) limestone of Ordovician age is the oldest geological formation producing oil in Illinois. It has produced oil at Westfield in Clark County, at Dupo in St. Clair County, and at Waterloo in Monroe County for many years and recently a few wells have been drilled to this horizon near Casey in Clark County. Widespread exploration in the eastern part of the state may lead to additional Trenton production, but at this time the Trenton is not an important producer of oil in Illinois.

Overlying the Trenton is the Siluro-Devonian which is productive at Martinsville in Clark County and at Prairie Creek in Vigo County, Indiana. More recently the Devonian has become an important producer at Salem, Tonti in Marion County, and at Centralia and Bartleso in Clinton County.

Some oil also is produced from the Devonian at Sorento in Bond County and in the old Decatur pool of Macon County. The discovery well at Louden also produced oil from the Devonian for some time before being plugged back to a more prolific horizon.

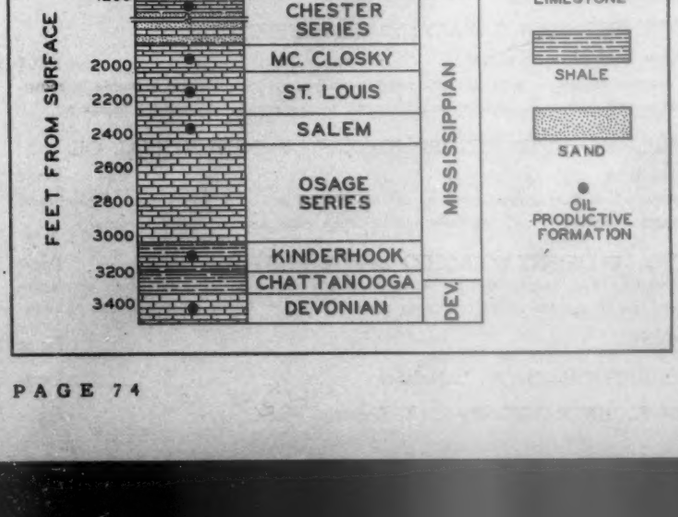


Fig. 1—This generalized stratigraphic section illustrates the position of the most important pays now being exploited in Illinois. The Chester series, McClosky and Devonian are the most prolific producers. Table 1 (right)—This table shows the relative position of the important producing formations in the Illinois basin, their corresponding pay horizons and the areas in which they are productive

TABLE 1

Formation—	Producing pay	Where productive—
Pennsylvanian:		
McLeansboro	Upper Siggins sand	Clark County, Illinois
	Parker gas sand	Clark County, Illinois
	No. Casey pool sand	Clark County, Illinois
Carbondale	Casey sand	Clark County, Illinois
	Upper Partlow sand	Clark County, Illinois
	Dykestra sand	Marion County, Illinois
Pottsville	Lower Partlow sand	Clark County, Illinois
	Robinsons sand	Crawford County, Illinois
	Bridgeport sand	Lawrence County, Illinois
	Biehle sand	Wabash County, Illinois
	Petro sand	Marion County, Illinois
Mississippian:		
Chester	Waltersburg	Gallatin County, Illinois
	Tar Springs	Southeastern Illinois
	Cypress sand	Richland, Clinton, Fayette, Marion, Bond, Crawford, and Lawrence counties, Illinois
	Paint Creek stray sand	Fayette County, Illinois
	Bethel	Marion, Washington, Fayette, Lawrence counties, Illinois
	Aux Vases	Marion, Wayne, Clay, Richland counties, Illinois
Ste. Genevieve	Rosiclare	Wayne, Clay, Richland counties, Illinois
	McClosky	Lawrence, Marion, White, Jefferson counties, Illinois
St. Louis lime		Marion County, Illinois
Salem lime		Marion, Clark counties, Illinois
Devonian:		
Devonian lime		Marion, Clinton counties, Illinois
Ordovician:		
Kimmswick	Trenton lime	Clark, St. Clair counties, Illinois

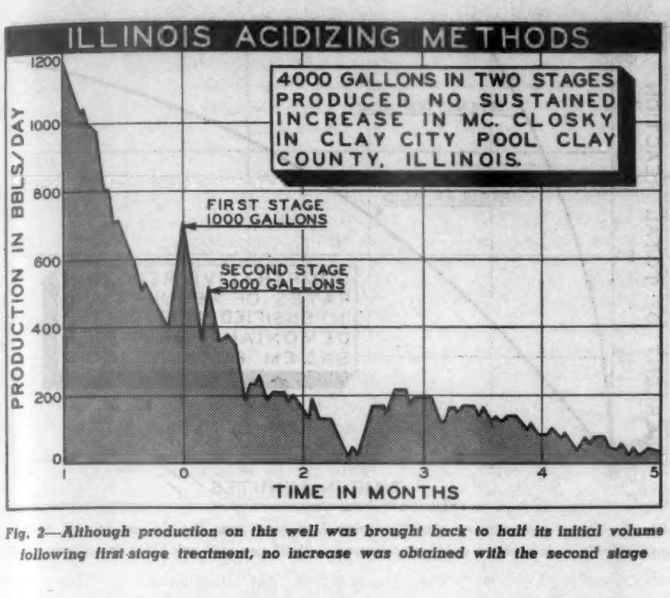

ILLINOIS ACIDIZING METHODS
4000 GALLONS IN TWO STAGES PRODUCED NO SUSTAINED INCREASE IN MC. CLOSKY IN CLAY CITY POOL CLAY COUNTY, ILLINOIS.
FIRST STAGE 1000 GALLONS
SECOND STAGE 3000 GALLONS
PRODUCTION IN BBLS./DAY
TIME IN MONTHS

Fig. 2—Although production on this well was brought back to half its initial volume following first stage treatment, no increase was obtained with the second stage

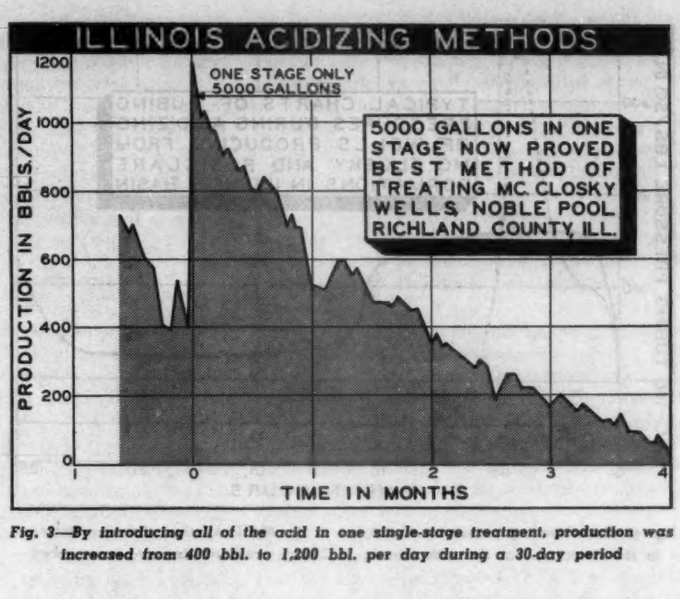

ILLINOIS ACIDIZING METHODS
ONE STAGE ONLY 5000 GALLONS
5000 GALLONS IN ONE STAGE NOW PROVED BEST METHOD OF TREATING MC. CLOSKY WELLS, NOBLE POOL, RICHLAND COUNTY, ILL.
PRODUCTION IN BBLS./DAY
TIME IN MONTHS

Fig. 3—By introducing all of the acid in one single-stage treatment, production was increased from 400 bbl. to 1,200 bbl. per day during a 30-day period

The Salem limestone of lower Mississippian age has its best development in the Salem pool of Marion County but also has produced much oil at Martinsville in Clark County.

Above the Salem is the St. Louis limestone which is a good producer of oil at Salem. It also has produced much oil at Martinsville and Westfield.

The Ste. Genevieve[3] formation contains a number of members, of which two are important producers of oil in Illinois. These are the Rosiclare and the McClosky. The Rosiclare produces in the Cisne pool of Wayne County and in the South Clay City pool of Clay County, while the McClosky zone carries much oil at Dundas, Noble, and Casey in Richland County; at Clay City in Clay County; at Fairfield, Enterprise, Big Mound, and Barnhill in Wayne County; at Stokes in White County; at Salem and Tonti in Marion County, and at Griffin in Wabash County, Illinois, and Gibson County, Indiana.

Above the lower Mississippian is the Chester series containing at its base the Aux Vases[4] which in some places has been acidized successfully.

The important Chester horizons found above the Aux Vases have not been acidized to any great extent and, therefore, will not be given much consideration in this paper. Table 1 shows the geological relationships of the various producing formations in Illinois and indicates where they are productive.

Development of Illinois Acidizing

The first wells treated in the present Illinois development employed the compound-treating technique. As this method had been successful in Kansas and West Texas it was only natural that it should be introduced into this new area. It soon developed, however, that for a given amount of acid, single-stage treatments would produce better results than compound treatments in the highly soluble, fast-acting McClosky formation. The single-stage treatment using about 5,000 gal. of acid, therefore, became standard practice in this area.

The production curves shown in Fig. 2 are typical of results obtained by compound treating. This well is located in the Clay City field of Clay County, Illinois, and was completed in August 1937, with an initial production of approximately 1,400 bbl. per day. By the end of September the production had declined to 400 bbl. per day. It was acidized with 1,000 gal. and production was increased to 700 bbl. per day. Two days later a second stage was made using 3,000 gal. with practically no increase in production. Fig. 3 shows results obtained by using the entire amount of acid in a single treatment. This well, located in Richland County, Illinois, was completed in January 1938, with an initial production of approximately 700 bbl. per day. Within 30 days the production had declined to less than 400 bbl. per day. The well was acidized using 5,000 gal. of acid. Following the treatment the well produced approximately 1,200 bbl. of oil per day.

Present Acidizing Practices

The Rosiclare, the uppermost formation acidized in the basin, varies widely in character from one area to another. In some areas it is almost a pure sandstone, in others it is an oolitic limestone, 75 or 80 per cent soluble in acid. In the Cisne field of Wayne County it is an oolitic limestone, slightly dolomitic and contains a small quantity of sand and chert. Permeability is fairly low and it produces an oil which emulsifies easily with acid, establishing a stable emulsion. In the Cisne and other pools it is difficult to differentiate the Rosiclare from the underlying McClosky. This is not of great consequence in fields where both formations produce oil but it is vitally important where the Rosiclare produces water. The Rosiclare is significantly different from the McClosky in its behavior during acid treatment. The pressure needed to force acid into the Rosiclare is generally higher than that needed for the McClosky and it invariably takes some surface pressure to force acid into the Rosiclare while the tubing pressure generally goes "on vacuum" during a treatment of the McClosky formation. Fig. 4 shows typical tubing pressures encountered during acidizing of the Rosiclare and McClosky formations. All treatments made in this pool use reduced surface-tension acid, resulting in lower treating pressures, increased production and a minimum of bad oil.

In the Woodlawn field of Jefferson County a few Rosiclare wells have been acidized and here the Rosiclare is usually found to be a limy sandstone about 30 per cent soluble in hydrochloric acid. The wells have a small initial production but show a moderate increase when acidized with 1,000 gal. of low surface tension acid. Emulsions of spent acid and oil present little difficulty in this area.

The McClosky limestone, below the Rosiclare limestone, is the next important producing formation. At present this is probably the most widespread producing formation in the basin. The McClosky limestone is remarkably uniform in character and wherever it produces oil it is an oolitic limestone, very porous, and highly soluble. Its reaction with hydrochloric acid is extremely rapid. In scattered areas the oolites are somewhat dolomitic and in other areas the cementing material is partially dolomitic. In a standard test a 1-g. sample of McClosky limestone ordinarily will prove to be from 95 to 99 per cent soluble in hydrochloric acid in 45 seconds or less. In producing areas the porosity will vary from 10 to 20 per cent, and permeabilities fluctuate widely due to the condition of its oolites.[5] If the original permeability of the formation is less than 50 millidarcys, the well usually will not make a good commercial producer even after acidizing.

In the eastern part of the basin the McClosky is not as thick as it is farther west and acidizing practices are somewhat different in the two areas. In the Noble, Clay City, Olney, and Cisne pools all of the acid is put into the formation at one time with little or no attempt made to direct it into the different parts of the producing formation. Results obtained from this method generally have been satisfactory. Low-surface-tension acid containing an emulsion-preventing agent is used in the majority of McClosky treatments. On extremely tight wells, or wells having a low initial permeability, low-surface-tension acid is always used because of the ease with which it enters the formation and the consequent lower-treating pressures.

Pressures are important because many wells do not have the oil string of casing cemented. High pressures may cause these uncemented seats to break through, thus letting in water and making it necessary to cement the pipe.

In the Stokes pool of White County the McClosky is acidized with good results without the use of an emulsion preventer. In direct contrast with this is the McClosky oil produced in the Barnhill pool of Wayne County, where a stable emulsion is produced between the oil and spent acid. This emulsion is difficult to break with any of the common emulsion-breaking agents.

In numerous cases, wells in this area have required cleanout or reacidizing due to the presence of oolites, closely cemented by calcium carbonate. When first acidized, the cementing substance apparently was removed and the oolites, being less soluble, remained in the formation. The force of the oil issuing from the formation into the open hole was sufficient to force this material into the

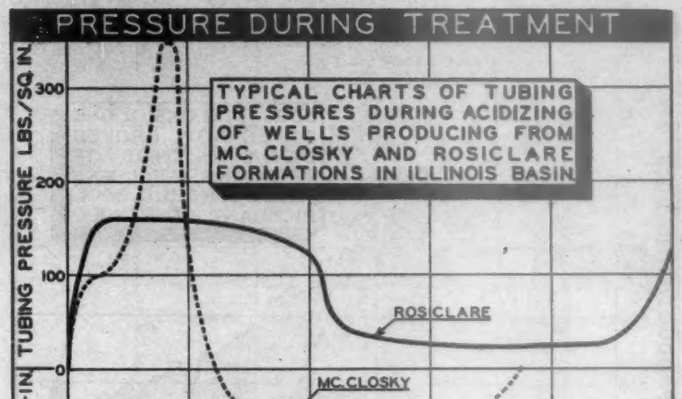


Fig. 4—Initial feeding pressures are higher in the McClosky than those encountered in the Rosiclare but the reduction in McClosky pressures is more pronounced

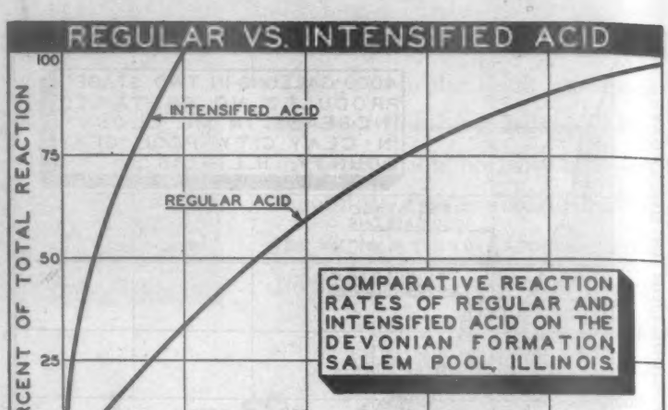


Fig. 5—These curves show that Devonian limestone from the Salem pool is 99 per cent soluble in intensified acid as compared with 97 per cent solubility in ordinary acid

well but it was not sufficient to carry it to the surface. The reacidizing was, therefore, necessary to dissolve and remove these small limestone pieces from the well.

Average-size treatments in the McClosky of the Salem pool are between 3,000 and 4,000 gal. per well. Some individual wells have been treated with as much as 24,000 gal. In more than 95 per cent of the wells low-surface-tension acid with a deemulsifying agent has been used with a minimum of emulsion troubles.

Northeast of the Salem pool is the Tonti pool of Marion County. The McClosky formation here, while not greatly different from the McClosky in the Salem pool, is not as extensively developed. Saturated sections are in general thinner; porosity, permeability, and average initial production are lower. The crude oil differs considerably from that in the nearby Salem pool and the emulsion preventers which were satisfactory at Salem proved to be of little value at Tonti. A new agent was found which satisfactorily prevented the formation of an emulsion between the spent acid and Tonti crude and since this time no trouble has been experienced from this cause.

The St. Louis is the next producing limestone below the McClosky and except in the Salem pool little is known about the response of this formation to acid. Initial production from these wells varied considerably but was generally low. Low-surface-tension acid containing a deemulsifying agent was used successfully in treating the first few wells completed. When swabbed in after being acidized many wells started flowing 100 bbl. or more per hour. Production soon declined to a few hundred barrels per day. Most of these wells, however, continue to flow and are steady producers. Development of the St. Louis production has been halted temporarily in the Salem pool due to the discovery of oil in the Devonian limestone.

The Salem limestone which immediately underlies the St. Louis limestone is an important producer of oil in the Salem pool and some production is still obtained from this formation in the Westfield pool of Clark County. The Salem limestone is a fairly pure calcium carbonate, somewhat dolomitic in places. Oil produced from it appears to be similar to that produced from the St. Louis. Only a few wells have been acidized in the Salem limestone but all of the treatments made have secured satisfactory production increases and the flowing life of the wells has been considerably prolonged by these treatments.

The Devonian limestone, found several hundred feet below the Salem, is a prolific oil producer in the Centralia, Salem, Tonti, Sandoval, and Bartelso pools and will probably prove to be productive in other areas.

The Devonian is a gray, dolomitic, highly soluble limestone having a moderately slow reaction rate with hydrochloric acid. A sample of the Devonian limestone from the Salem pool tested 97 per cent soluble in 25 minutes in 15 per cent hydrochloric acid. A sample of the same lime in intensified acid was 99 per cent soluble in 5 minutes. Fig. 5 shows the reaction rate of Devonian limestone from the Salem pool in regular and intensified acid. In the Sandoval pool, however, the Devonian limestone is only slightly dolomitic and the increase in rate of reaction with intensified acid is negligible.

Oil produced from the Devonian limestone in most pools of the basin reacts in a like manner with acid or spent acid. It emulsifies easily and forms a very stable emulsion. Here again, the Sandoval pool of Marion County is an exception. Acidizing in the Sandoval pool presented a difficulty not heretofore encountered in the Illinois basin. The first wells acidized were given large treatments and they responded with huge increases in production but within a few days they were

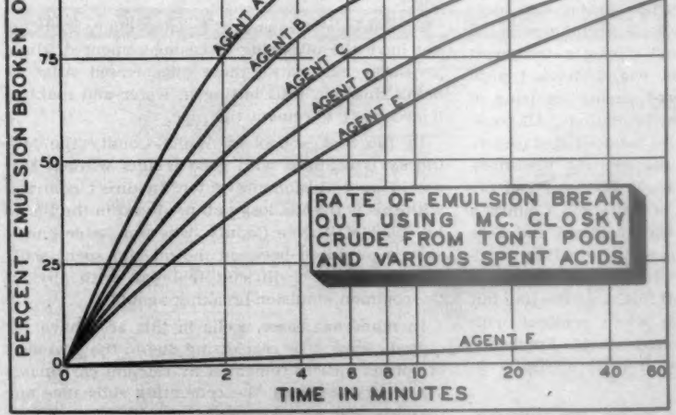


Fig. 6—Acids containing special additive agents are effective in minimizing emulsification between crude oil and spent acid as compared with ordinary acid not containing an emulsion breaker

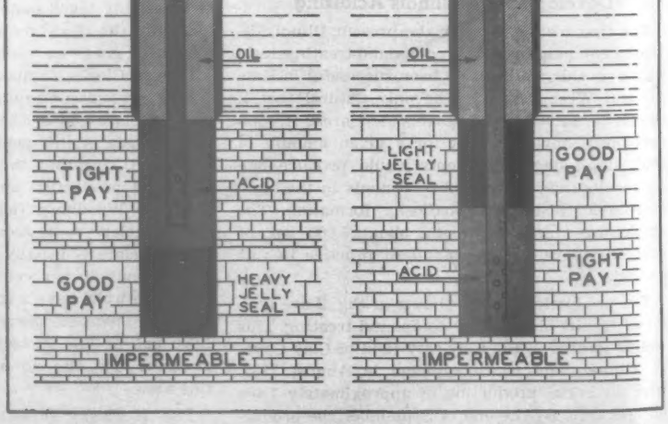


Fig. 7—The use of jelly seal permits blocking off a permeable section to allow acidizing a tighter pay zone and directs the acid into the more productive section

making considerable water along with the oil. The proportion of water to oil increased rapidly and within 2 weeks they were making as much as 80 per cent water. Operators were aware that the water table was very close below the oil-saturated part of the formation and consequently wells were carefully completed. Except for the first few wells completed, the average depth of penetration into the saturated zone did not exceed 6 ft. and the average acid treatment was between 200 and 300 gal. Even with these precautions salt water was encountered but this trouble was minimized by holding back pressure on the wells. Low-surface-tension acid containing a deemulsifying agent was used in practically all treatments.

The Devonian limestone of the Bartelso pool, Clinton County, is much more dolomitic than that in the Sandoval pool and the oil produced is also somewhat different. Increases obtained from treating these wells have been satisfactory, the wells settling down to 30 or 40 bbl. per hour after acid treatment, from an initial production of 100 or 200 bbl. per day.

Only one well has been completed in the Devonian formation of the Tonti pool of Marion County. The core from this well was very dolomitic and slow acting in acid. Intensified acid is recommended for the formation.

To date only a few Devonian wells have been completed in the Centralia pool. These were acidized with intensified acid containing a deemulsifying agent and the wells responded favorably to treatment. The formation in this pool is dolomitic and the oil makes a stable emulsion with the acid.

Development of the Devonian formation in the Salem pool is proceeding at a rapid rate. The producing formation is a hard, porous dolomitic limestone. The thickness of the saturated part varies considerably, averaging about 50 ft. Initial production ranges from 30 bbl. per hour to 130 bbl. per hour before the wells are acidized. Increased production from acidizing has been comparatively large. By using an intensifier, the dolomitic formation reacts very satisfactorily in acid. In addition to the large oil production, some wells make 7,000,000 to 10,000,000 cu. ft. of gas per day.

The Trenton limestone produces from two widely separated areas in the Illinois basin. In the vicinity of Dupo and Waterloo in St. Clair and Monroe counties, respectively, some production has been found in the Trenton but in most cases the oil contains large quantities of water. If water is not present when the wells are drilled in, it usually appears shortly thereafter. In this area the Trenton is a fairly porous, slightly dolomitic limestone. Its solubility is fair and its reaction with acid is comparatively rapid. Satisfactory results are obtained by using sustained-action acid containing a surface tension lowering agent.

Production is also obtained from the Trenton limestone in the vicinity of the Westfield and Martinsville pools of Clark County. One well recently completed produced 180 bbl. per day on completion. The formation is somewhat dolomitic and it is probable that if any extensive new areas are opened, intensified acid will be used.

Auxiliary Chemicals

Approximately 87 per cent of all acid used in the Illinois basin contained an additive agent to prevent the formation of emulsions between the spent acid and crude oil. This was especially true in the McClosky formation where the oil emulsifies easily.

Several agents are capable of preventing or minimizing emulsions between fresh and spent acid with the oil, and it has been found that an agent which is a satisfactory emulsion preventer with a certain crude oil is not necessarily satisfactory when used with a different crude oil. Different agents, therefore, must be used with different oils. Fig. 6 shows the behavior of acid containing five different emulsion breakers in contact with McClosky oil from the Tonti pool. The wide variation of effectiveness among various agents and types of oils necessitates a test of the oil to insure the use of the best agent in a particular locality.

When a new field is discovered a sample of oil is brought to the laboratory where it undergoes a series of tests. A small quantity of oil, about 15 cc., is placed in each of several test tubes. Different types of acid and spent acid are placed in the test tubes with the oil. The tubes are shaken vigorously about 30 times and a check is made on the time required for the emulsion to break. If the test is made under temperature conditions similar to those to be encountered in actual practice, it is a good indication of the kind of acid which should be used on the formation from which the oil was obtained.

An important auxiliary chemical, especially in the retreatment of wells, is sustained-action acid. The main advantage of this chemical is in the treatment of highly soluble limestone such as the McClosky. Numerous wells in Illinois, Indiana, and Kentucky have been treated with this acid with outstanding results. Sustained-action acid is ideally suited for the retreatment of fast-acting limestone where it is necessary to obtain much deeper penetration than was obtained on the original treatment. This objective is not obtained altogether either by the use of larger quantities of acid or by the more rapid introduction of acid. In traversing the necessary distance, ordinary acid, regardless of the amount, is spent before it reaches the untreated portion of the formation and the fallacy of trying to obtain this objective by fast introduction is that the faster the introduction, the more rapid the rate of reaction. This has been proved frequently in laboratory tests, where acids of various concentrations have been forced through limestone cores at various rates of flow.

Jelly seal has been used extensively in acidizing wells having thick producing sections with varying porosities and separate producing zones. When the long saturated sections are treated in two separate parts, the tighter of the two, regardless of its position, whether above or below, is always treated first. If the tighter section is at the top, the well is prepared for treatment by running tubing to the bottom of the hole and introducing enough heavy jelly seal to cover the lower, more permeable section. Then the tubing is raised so that the lower end is above the top of the jelly seal and the upper tighter part of the formation is treated with acid.

If the least permeable portion of the saturated section is at the bottom of the well, then the technique used in treating is almost exactly opposite to that described in the previous paragraph. The tubing is run to bottom opposite the tight section, floating jelly seal is run ahead of the acid and spotted opposite the upper pay. This allows acidizing the lower portion without permitting acid to enter the most permeable part of the formation. Fig. 7 illustrates the use of jelly seal to block off a permeable section prior to acidizing the tighter zone; the illustration on the left depicts the procedure when the more permeable section is on the bottom and the illustration on the right when the more permeable section is on the top.

Following treatment of the tighter pay section the jelly seal may be displaced up into the pipe and both sections treated simultaneously on the next stage of the treatment, or jelly seal may be used to block off temporarily the section which has already been treated while treating the other zone.

So far the McClosky formation has its best development in the Salem pool of Marion County. In the structurally highest parts of this pool, from 40 to 60 ft. of saturation are common and in a

(Continued on Page 88)

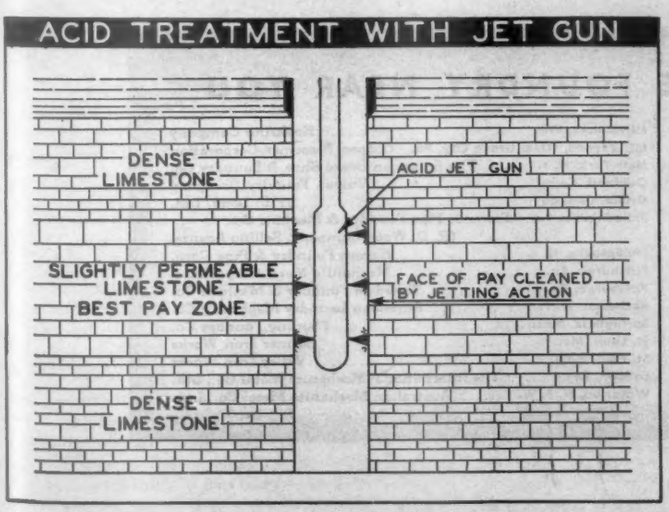


Fig. 8—Acidizing through the jet gun permits more effective treatments because the acid can be directed into all of the important pays by setting gun opposite these zones

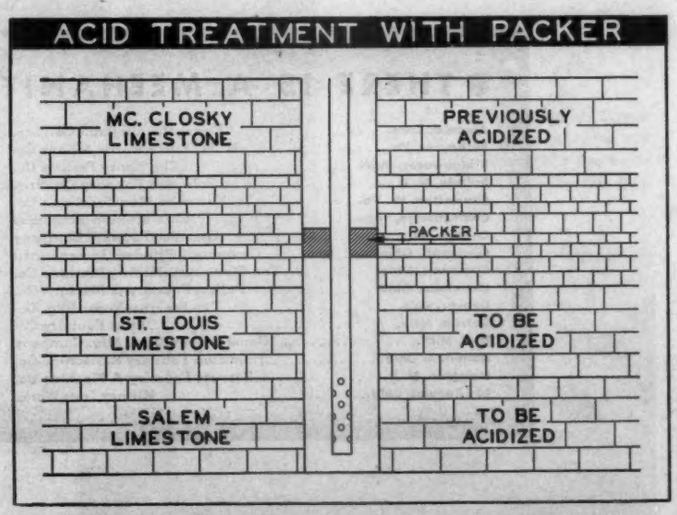


Fig. 9—Acidizing below packers is necessary to secure maximum results in the treatment of certain types of wells which have been deepened to new pay horizons

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Illinois Uses Several Explosives And Tamping Methods

By HARRY F. SIMONS

Left: Wooden plug which fastens on the bailer dart with a bolt used for running in hole to test location of shot, position of umbrella, and height of tamping. Right: The time bomb and umbrella are run in at the same time and when the line is pulled from the hole the outer case is removed from the umbrella and it opens

ABOUT half of the fields in the Illinois basin are producing from sand formations and practically all of the wells in such fields have been treated with an explosive shot of some type as an aid to increasing the initial production. The wells not shot at completion for some reason are being shot as the production crews get around to it. However, there is no standard "shooting" practice in Illinois, each company using a technique best suited to its own problems. Size of the explosive charge varies with each operator and with the formation condition in the particular field or well, as does the method of tamping and discharging the shots.

A new-type gypsum cement, which sets quickly, has recently come into wide use in the basin fields as a tamping medium. It is run in on top of the shot in a bailer made of removable metal. sets within a few hours and thus reduces the time setting on the bomb. It is also easier to clean out after the shot has exploded than the sand or gravel tamping. The special boiler is used so it can be drilled out easily in case it becomes stuck. Another procedure introduced in Illinois is the disposal of removable casing by shooting, thus saving the cost of installing a cable-tool machine or pulling unit over the hole.

Liquid nitroglycerin, the old standby of the oil industry, is used in most cases, although for certain jobs the solidified nitroglycerin is preferred. While the former is more dangerous than the latter, one shooting authority points out that actually more premature explosions are accredited to the latter due to the carelessness of individuals handling it who think it can be treated disrespectfully.

Practically all of the sand production is from the Chester series of the Mississippian. The sands are quite shaly in some localities and approach true sandstones in others. Permeability ordinarily ranges from 100 to 300 millidarcys and porosity varies from 15 to 25 per cent. The sands are thus seen to be fairly tight generally and crack quite easily under a comparatively small shot.

In one field two pays are separated by a nonproductive layer, making a total of 160 ft. to be shot at one time. The productive zones vary from a few feet in thickness to as much as 90 ft. In this case a loaded anchor, a small tube with a light charge of explosive in it, connects the heavier charges below and above the unproductive layer. In addition, the casing must often be set into the pay sand in some fields to eliminate the possibility of water encroachment from the formation immediately above it. This often leaves only a few feet in which to place a shot and tamp it and failure to install the shot satisfactorily has caused several casing repair jobs.

Safety Considerations

The farther the shot can be located away from the casing shoe the better the production men like it. One company seldom gets within 15 to 20 ft. of the casing shoe. Most superintendents hesitate to order a shot within 10 ft. of the shoe, although some have shot within 6 ft. of the shoe and in an extreme case within 3 ft. of the bottom of the casing. The shot in the latter case was 8 qt. of solidified nitroglycerin dumped into the hole; the bomb was run into the glycerin, and no umbrella was used but a small amount of chat dumped on top of the shot; then sand was added to bring the tamp well up into the casing, and oil placed on top of this to fill the entire casing string. Production on the well increased, but the superintendent admitted that he didn't feel any too safe about the outcome. Principal damage from faulty shooting close to the casing is the wrinkling, splitting, or buckling of the casing just above the shoe and breaking of the bond

Left: Sand for tamping is poured in the hole while a small stream of water is run in with it. In many cases water is not used

Below: Loading a shot in an Illinois well. The shooter is going to the well to get the feel of the line while his assistant unlatches the line from the shells

between the cement and casing, thus letting water in from above and necessitating a squeeze job if the well is to be produced satisfactorily.

The general practice is to use solid tamping of some type, either the special quick-setting gypsum cement, sand, or gravel, or a combination of these three, although one company uses fluid tamping and has had satisfactory results from its shooting program. However, the shots used were small compared to others.

When using fluid tamping, the shot is run into the hole and hangs on a line preparatory to discharge; the hole is then filled with fluid and kept full, even if a small stream of oil must be kept running in the hole. Oil is used as a fluid in tamping as water will rush into the sand after discharge of the shot, causing water-lock. The hole is kept full as a concentration of the vibrations at the fluid level will cause splitting or buckling of the casing at that point if it is down the hole. The concentration of vibration waves is also present at the contact point of two different fluids, such as oil and water.

A bumper squib is used for discharging the shot. The squib contains two caps and is detonated by droping a weight on it, guided by the line supporting the shot. The principal advantage of this method is the saving in cost and time, as the well can be shot in a few hours and little or no cleaning-out work is necessary afterward.

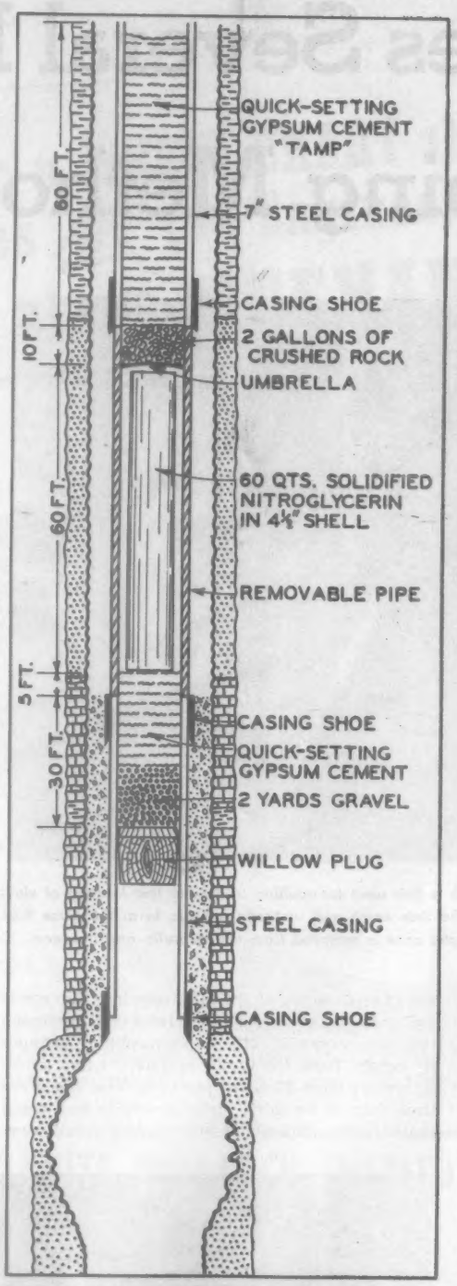
This company uses a variation of the same procedure where there is ample space below casing and more shattering of the formation is desired than can be obtained by a single shot of about 10 qt. A sequence of shots is used, the first one being 4 qt., the second 6 qt., and the third 11 qt. The shots are purposely held off bottom so as to provide a pocket for the accumulation of debris caused by the explosion of the shots. Running of the bailer after each shot determines whether any cleaning out is necessary before running the next shot.

Reduce Time Set on Bomb

Use of the quick-setting gypsum cement has enabled one company to reduce the time set on the bomb from 24 to 12 hours and at the same time gives more assurance that the shot will be effective, while chances of damage to the casing will be reduced. The same company has adopted a policy of extreme caution where there is an indication that the cement job behind the casing at the time of the completion may have been unsatisfactory. Unsatisfactory cement jobs are not particularly common and are due to porous formations stealing the cement and to channeling of the cement as it is pumped around the pipe. In the former case it will take excessively long for the cement to return to the surface outside of the pipe and in the latter cement circulation will be noted in less than the average time. In either case there may be a void in the cement around the pipe, either near the casing shoe or some distance removed from it.

Ordinarily, fluid tamping is not used with the gypsum-cement tamping as it is unnecessary, but if there are any indications of a void in the cement behind the pipe, about ½ yard of sand is placed on top of the gypsum-cement tamp and then the hole filled with oil. This prevents breaking of the pipe at the gypsum-cement-fluid contact.

For shooting below the casing, the charge of liquid nitroglycerin varying from 10 to 180 qt., depending on the amount of hole being shot, is run in the hole and the 12-hour time bomb and umbrella placed on top of it. About 2 gal. of crushed rock is placed on top of the umbrella and then the bailer run to test the bridge, after which from 40 to 50 ft. of the gypsum cement is placed on top of it. Twenty feet of the gypsum-cement tamp is allowed for each 10-qt. shot up to 30 qt. After the shot is discharged, the cleaning out is started immediately.



Schematic drawing showing method of shot placement and tamping when shooting out removable casing in Illinois wells

Shooting out of the removable casing for two-zone completions calls for accurate placement of the solidified nitroglycerin shot and adequate tamping both below and above the shot zone. The method is used where comparatively short sections are to be removed. When running casing for this type job, steel pipe is set on top of the lower pay sand and up to the bottom of the upper pay zone where an inverted casing shoe is located. The pipe opposite the upper pay is special pipe which can be removed later and just above it is another casing shoe on the bottom of the steel pipe. The casing shoes have special threads for coupling the removable pipe to the steel pipe and their use helps prevent damage to the steel pipe while shooting.

Shooting Out the Pipe

For shooting out the pipe the bottom tamping is made by running a wooden plug about 30 ft. below the middle casing shoe and then bridging with a couple of yards of gravel. About 20 ft. of the gypsum cement (two sacks) is then placed on top of this plug to bring the tamp about 5 ft. into the removable section. In case the gypsum cement does not bring the tamp to the desired level, more may be added, or sand may be used to bring the tamp to the proper height.

From 10 to 60 qt. of solified nitroglycerin in 4½-in. shells is used to shoot out the removable pipe. Liquid nitroglycerin is not used as it would either have to be placed in a very small shell or the charge would have to be more concentrated. The solidified explosive is less dense and occupies more space and the shot can thus be distributed more evenly up and down the hole. In addition the solidified nitroglycerin explodes with less velocity and the removable pipe is more effectively consumed. Tables 1, 2, and 3 give a comparison of other explosives with nitroglycerin and show that gelatin (solidified nitroglycerin) has a relative value of 100. However, this is for atmospheric conditions and the velocity of detonation of the gelatin is inversely proportional to the pressure and under well conditions it has a lower velocity.

The umbrella for the upper tamps is set from 5 to 7 ft. below the uppermost casing shoe, the hole bridged in the regular manner and then the proper amount (40 to 60 ft.) of the quick-setting gypsum cement placed on top of it.

Another oil company, which uses shots varying in size from 20 to 100 qt. of liquid nitroglycerin and sometimes similar amounts of solidified nitroglycerin, uses pea gravel (gravel washed free from clay particles which will pass through a

(Continued on Page 90)

TABLE 1—COMPARISON OF OTHER EXPLOSIVES WITH NITROGLYCERIN*

Explosive—	Specific volume (liters)	Explosion temperature (°C.)	Explosion heat (calories)	Characteristic product	Relative value
Gelatin†	710	3,540	1,640	1,164,000	100
Nitroglycerin	712	3,470	1,580	1,125,000	97
N.G. dynamite, 40 per cent	840	2,900	1,290	810,000	93

TABLE 2

Explosive—	Heat of explosion (calories)	Work done (meter kg.)	Relative value
Gelatin†	1,640	700,000	100
Nitroglycerin	1,580	670,000	86
N.G. dynamite, 40 per cent	1,290	550,000	79

†These determinations are made on a weight basis and not a volume basis. This is important, as when loading a bore hole the bulk strength must be used, and this can be determined from relative density, which for liquid nitroglycerin is 1.6 and for gelatin is 1.34 (varying with age of the explosive).

TABLE 3—COMPARISON OF OTHER EXPLOSIVES WITH NITROGLYCERIN*

Explosive—	lb./qt.	Gases cu. ft./lb.	B.t.u. per lb.	Kinetic energy ft. lb./lb.	Pressure lb./sq. in.	Velocity of detonation ft./sec.
Gelatin, 100 per cent	2.85	173	2,960	2,300,000	156,300	8,000-23,600
Nitroglycerin	3.25	157	2,850	2,120,000	150,050	23,600
Gelatin, 80 per cent	2.73	135	2,650	1,426,000	142,233	21,700

*From the A.P.I. paper presented before the Illinois basin chapter by Paul F. Lewis.

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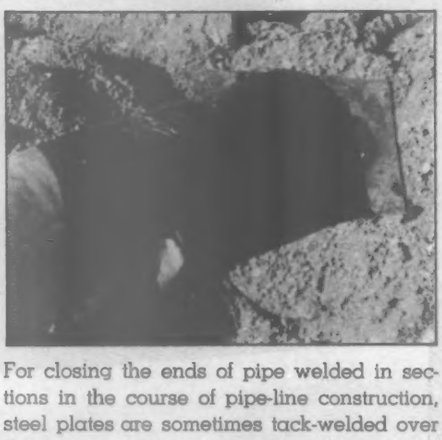
Operating Ideas

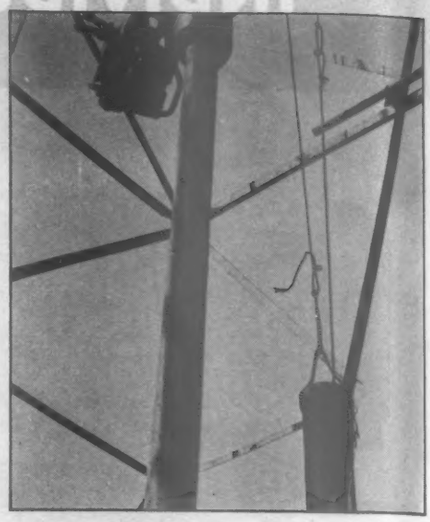
Large Box for Equipment

The mud gets very bad during part of the year in Illinois and if something is dropped it may sink out of sight. This is one of the variations used by drilling contractors to care for smaller pieces of equipment; it is a large steel bin with runners on it for loading it on trucks. Because it has a solid bottom, it will not sink in the mud and can be pulled into the location. One side of the box can be taken off, thus allowing the men to walk in and pick up the equipment they need.

Protector for Pipe



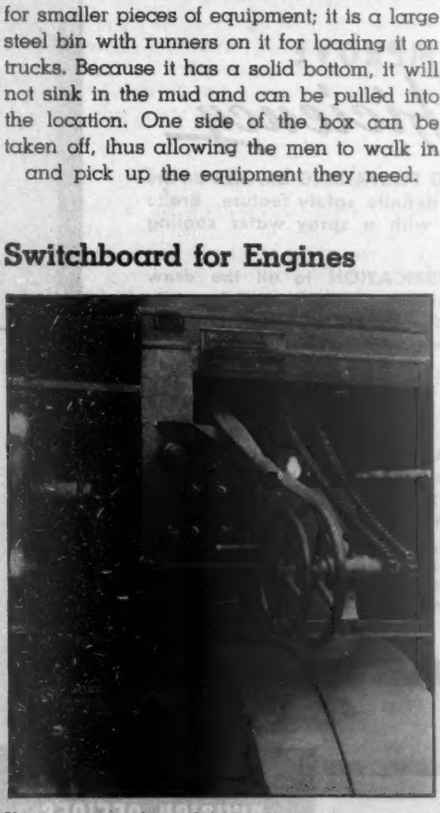
For closing the ends of pipe welded in sections in the course of pipe-line construction, steel plates are sometimes tack-welded over the opening. These serve to keep out dirt, weeds, and small animals that might get into the pipe between the time the sections are completed and the time they are tied in to the rest of the line. This practice has been found to have advantages over the common practice of covering the ends of pipe with gunny sacks for the same purpose.



Wire Line Used for Counterbalance Guide

Instead of the conventional hay pulleys, this drilling crew used a ⅝-in. sand line running through a steel loop to hold the tong counterbalances close to the sides of the derrick. This is a variation of using 2-in. pipe running through a collar for this purpose. The sand line is attached to the derrick girt just above the V-door and is equipped with a turnbuckle for tightening. This system is quicker to install and the counterbalances will travel freely up and down the line.

Switchboard for Engines



If an engine dies, the driller on this rig has only to punch the proper buttons located on the panel close to the throttle to start it again; this eliminates the necessity of sending a man back to the motors to start them. The board also has switches for cutting off the ignition on each motor in case of emergency and the clutches do not disengage.

Collapsible Baffles Aid Removal of Shale

In the Hull-Silk field of North Texas, large amounts of shale are encountered in drilling the 3,800 and 4,300-ft. wells. To slow down the mud stream in the pits, thereby causing the shale particles to settle, operators have adopted the use of steel baffles of the type shown here. The one shown here is different from others in use in that the baffle is hinged in the center so that it is easier to handle when the rig is moved. The partition is made of tank steel reinforced on the edges and in the center with pieces of 1½-in. steel rods. The baffles are placed in the pit into which the mud line discharges, so that by means of holes cut in the partitions flow of fluid is regulated and most of the shale is deposited in the first pit and only small amounts enter the pit where the mud pump takes suction. When the rig is to be moved the two halves of the partitions are folded together and lifted from the pits by truck boom-chain hooks placed through the steel eyes welded on the top braces.

Thermal Reforming Plus Catalytic Polymerization

By R. P. MASE and N. C. TURNER
Mase-Turner Engineering Co.

W.P.R.A.—Presented before annual meeting at Wichita, Kans., March 31-April 2, 1940

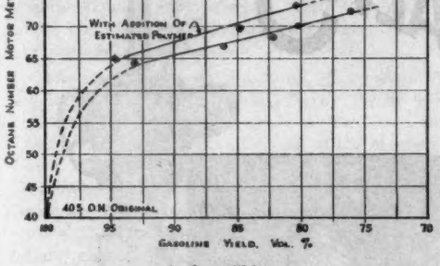
BECAUSE of the upward trend now current in motor-gasoline octane number, there is a desire among refiners to learn something of the process development that will aid them in keeping in step with the octane parade. It is not within the scope of this paper to discuss the reasons for, or even the economic desirability of, the upward antiknock tendency. We know the situation exists. Accordingly, we are offering the following information in the hope that it will prove of interest and help to the refining industry.

We are attempting to synthesize and pass on to you the best information obtainable concerning one particular process method, namely, thermal reforming of straightrun naphtha, plus catalytic polymerization of gaseous products resulting from reforming.

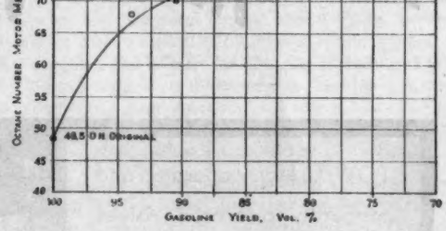
The information contained in the following is based on test results and data furnished by Dr. Gustav Egloff, of Universal Oil Products Co.

The method and equipment used in thermal reforming is well known to the refining fraternity. Equally well known is the common weakness of this scheme, namely, that the gas loss is quite large, especially when high-octane gasoline is produced. Catalytic polymerization plants have become common enough in the last year or two so that they too are known and understood by most refinery men. . .

By combining thermal reforming with catalytic polymerization, a definite improvement is made, first, in reduction of losses, and, second, in increase in octane number, as compared to the results of straight reforming. We have carefully studied the results of two experimental runs performed in Universal Oil Products Co.'s laboratories, and are satisfied with the fundamental correctness of the data, and of its applicability to plant operations.



Curve No 1



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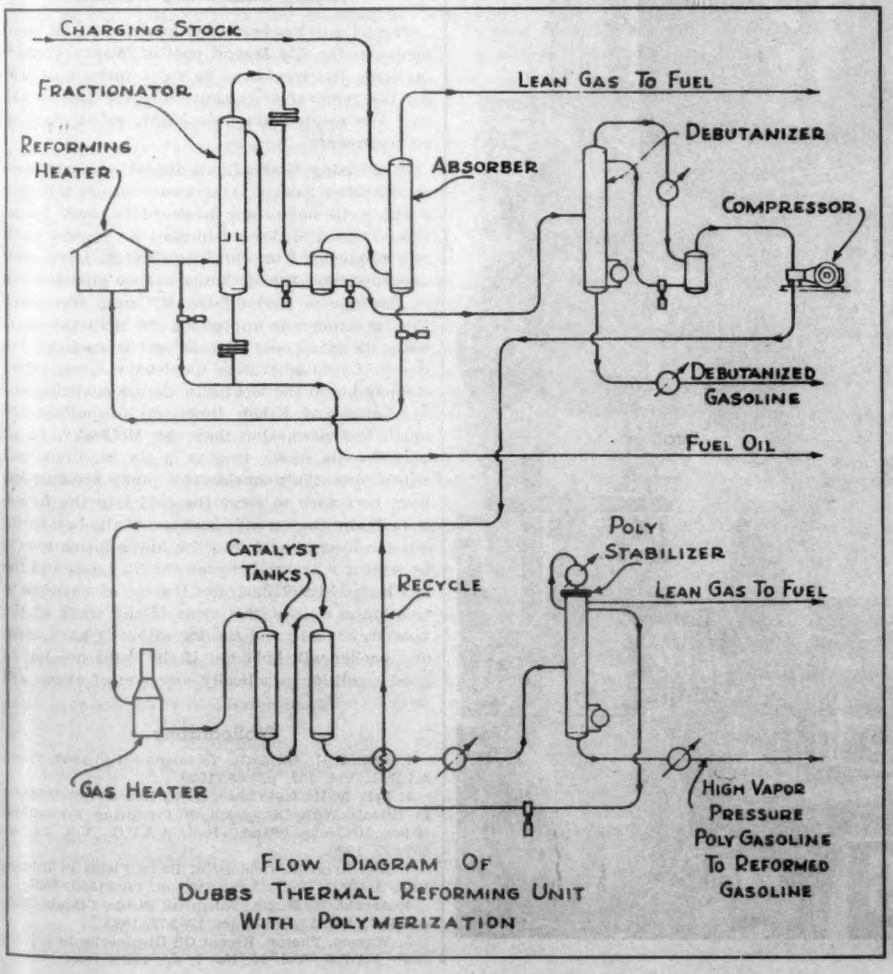

Flow Diagram Of Dubbs Thermal Reforming Unit With Polymerization

Charging Stock

In the first run under consideration, charging stock was a Mid-Continent straightrun naphtha, 53 A.P.I., 208° initial, 389° F. end point, and having a 40.5 motor-method octane. This charging stock was reformed thermally with 1,000-lb. coil pressure and transfer temperatures from 960° F. to 1,000° F. Yields by volume and motor-method octane, as the temperature was stepped up in 10° F. intervals, was as follows:

Yield per cent by volume	93.0	86.1	82.1	80.1	76.1
A.P.I. gravity	56.9	56.8	56.4	56.1	56.2
Motor-method octane	64.5	67.0	68.5	70.0	72.5

End point in all cases approximately 400° F.

If to the above normal catalytic polymerization product be added the data is as follows:

Yield per cent by volume	94.6	84.9	80.4
Motor-method octane	65.0	69.5	73.5

Octane numbers by research method would be from four to eight points higher, the wider discrepancy appearing at the high octane end of the table.

In the above tabulation, the improvement due to polymerization of gaseous products resulting from reforming is not as apparent as when the results are plotted with octane number against gasoline yield. The reason for this is that corresponding figures in the tabulation show improvement in both yield and octane, but the total improvement is not so easily noted. By reference to Curve 1, showing the above data graphically, it is apparent that thermal reforming alone will produce a 70 motor-method octane product with an 80 per cent yield of product, based on feed volume, while with catalytic polymerization added, a 70 motor-method octane can be produced, with 85 per cent yield of product. In short, on an equivalent octane basis, a 5 per cent increase in yield, on an equivalent 70 octane, is had by adding polymerization, or conversely, the loss is cut by 5 per cent. On the basis of an equivalent yield of, say 85 per cent, the octane may be increased by 2.5 points, with the addition of polymerization.

In the second run on which we are reporting, the charging stock was a West Texas straightrun naphtha, having 49.9 A.P.I. gravity, 191° F. initial, 408° F. end point, and motor-method octane

of 48.5. Coil pressure was 750 lb. and transfer temperatures 950° F. to 990° F.

Yield per cent by volume	94.0	90.1	87.4	85.6	83.9
A.P.I. gravity	53.9	54.1	53.7	55.2	54.4
Motor-method octane	68.0	70.0	72.0	73.5	74.5
Research octane	75.5	...	...	82.5	83.5

In order to show improvement by polymerizing gaseous products and adding the product to the reformed product, Curve 2, is given. Again it will be noted that for a given octane number, about 5 per cent more yield (i.e., 5 per cent less loss) is encountered when catalytic polymerization is added to thermal reforming, and, of course, it follows that higher octanes can be achieved by adding polymerization than are otherwise possible by thermal reforming.

Acidizing Illinois Limestones Presents Many Problems

(Continued from Page 79)

few wells the saturation extends through a vertical distance of 140 ft.

In numerous cases, wells in this area have required cleanout or reacidizing due to the presence of polites, closely cemented by calcium carbonate.

Mechanical Treating Devices

The jet gun is one of the most important tools yet devised for the chemical treatment of a well. In the Illinois basin the jet gun is used for three common purposes: for removal of cement sheaths left on the walls of the producing formation after a cement job, for the treatment of tight wells, and for the routine treatment of an oil well. Experiments made on the surface with the jet gun show only a few minutes' time is required to jet large holes through a thick block of cement. Excellent results have been obtained in removing cement from a formation that has been cemented off.

In the treatment of nonpermeable wells the jet gun reduces the pressures necessary to force acid into the formation. The usual practice in treating this type of well is to set the jet gun opposite the most promising part of the formation and jet the acid against the formation without loading the hole, as shown in Fig. 8. As soon as all the acid has been flushed through the gun a quantity of oil sufficient to force the acid out into the formation is pumped into the annular space between the tubing and casing. After jetting, the acid still retains about 75 per cent of its original strength and this will be wasted if the acid is not forced back into the formation.

Jet-gun-treatment methods depend largely on thickness of the pay formation and the amount of acid used. Ordinarily six or nine jets are used. This permits acid to be introduced through the gun at from 20 to 30 g.p.m. For efficient use of the jet gun it should remain stationary for 5 to 10 minutes after jetting has begun. Therefore, the vertical distribution of the acid over the formation is governed largely by the amount of acid used. Usually when one of these treatments is being made, the well is equipped with a flexible hose connecting the pump to the tubing. If the well is equipped with the proper type head, the flexible hose permits the tubing to be raised and lowered at will.

Highly Satisfactory Results

The jet gun has been used in a number of treatments in the Big Mound pool of Wayne County, both for the treatment of tight formations and for the removal of cement from the face of the pay. The results have been highly satisfactory on all treatments.

In acidizing the St. Louis and Salem formations in the Salem pool it is necessary to use a packer if the wells have been deepened to these formations from a shallower formation. Several wells now producing from the Salem and St. Louis were deepened from the McClosky and no pipe was run in the hole to shut off the McClosky formation. The intention was to produce the McClosky along with the St. Louis and Salem as soon as the newer formations were depleted to an extent comparable to the McClosky. Before acidizing, the St. Louis and Salem limestone formations are much less permeable than the McClosky. In all of the wells so far treated in the St. Louis and Salem formations considerable pump pressure has been necessary to force the acid into the formation. Under these conditions one of the best methods for forcing acid into the lower formations is by setting a packer between the St. Louis and the McClosky. Fig. 9 illustrates the use of a packer in treating a well of this type. If the walls of the hole are smooth and the formation is hard, most any packer will hold but if the walls are not in good condition practically any one of them will fail.

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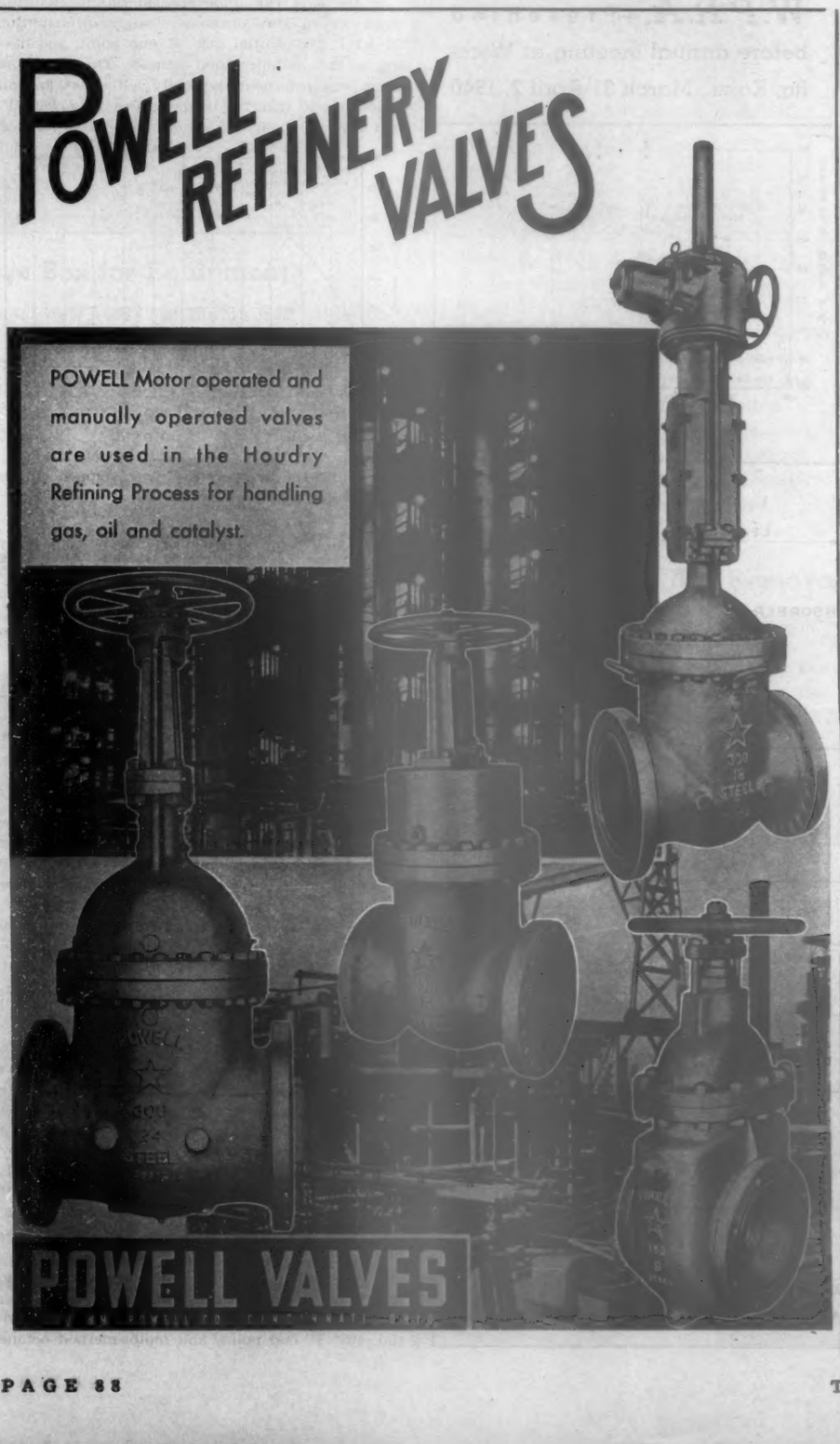
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California Drilling Speed Record Broken by Continental Oil

By L. P. STOCKMAN

CONTINENTAL OIL CO. has broken all deep-drilling records so far as time is concerned by drilling 13,157 ft. of hole and landing 12,878 ft. of 6⅝-in. casing in 60 days. This record was made in No. 5-8-A Kern County Land in the Wasco field, Kern County, California, and was climaxed when the well blew in flowing 2,568 bbl. of 37.9-gravity oil and 240,000 cu. ft. of gas per day while the crew was coming out after leaving the bit and 12 ft. of drill pipe in the hole. No attempt will be made to recover the fish while the well continues to flow.

The well reached a depth of 10,000 ft. in a total elapsed time of 21 days and had logged 12,000 ft. in slightly less than 40 days after spud. In 51½ days total elapsed time the drilling department had landed 995 ft. of 13⅜-in. surface pipe and cemented a 6⅝-in. water string at 12,878 ft. It took a little over 9 hours to run and land the 12,878 ft. of 6⅝-in. casing. This string consisted of 5,000 ft. of 6⅝-in., 24-lb., Grade N-80 internal upset, eight-thread, National seamless; 2,500 ft. of 24-lb., Grade N-80, eight-thread, round thread; and 5,378 ft. of 24.1-lb. Grade N-80, eight-thread, round thread. The best previous drilling record was 32 days total elapsed time to 10,000 ft. and 53 days to 12,000 ft. This indicates that Continental Oil Co. exceeded the previous fastest drilling record by approximately 34.37 per cent down to 10,000 ft. and exceeded the previous record down to 12,000 ft. by 25.55 per cent.

In the first well that Continental Oil Co. drilled at Wasco it required 62 days to reach 10,000 ft., which then represented a new deep-drilling record. The 12,000-ft. level was not reached until 200 days after the well had been spudded. These 200 days included 68 days spent in a complex fishing job so that the net time to reach 12,000 ft. was 132 days. The new record not only cut the time in half but drilled more hole in less time. Continental's first well in the Wasco field established its record late in 1937 so that, in a little over 2 years, the company has reduced drilling time to less than half that required to do the same work in the same field in 1937.

No. 5-8-A Kern County Land, Section 8-27-24, was bottomed in oil sand at 13,157 ft., reached in 60 days' total elapsed drilling time. The well is producing from that depth. It was finished with 399 ft. of 5-in. o.d. Securaloy liner landed and cemented at 13,125 ft. and a 3½-in. o.d. Securaloy drillable tail piece at 13,125-44 ft. After the liner had been landed there was some question as to whether a satisfactory water shutoff had been effected but the well blew in before a test could be made. As a matter of record, the well was on production exactly 81 days after it was spudded.

Equipment

Very little of the equipment used was new and certain changes were made as drilling progressed. The following is a partial list of equipment: The derrick was a 178-ft. Ideco with an 8-ft. extension. The standby hoist was a Hopper double-drum type SS-H. The motor operating the standby hoist was a 65-hp. Westinghouse, 440-volt, 60-cycle, 750-r.p.m. The rotary table was an Ideal H.S. 20½. The crown block was an Emsco, seven-sheave, Type A-50-3, and the traveling block was an Emsco six-sheave, Type A-94-50. A Byron Jackson Triplex hook with a rating of 300 tons and an Ideal swivel were also used. A mud-suction tank measuring 7 ft. 9 in. by 18 in. by 3 ft., 8 in. high, of the company's own design, was used along with two mud-storage tanks of similar design and measuring 7 ft. 6 in. by 18 in. by 8 ft., 6 in. high. Two Link Belt vibrating mud screens, Type N.R.M. 145, operated by a 3-hp. Leland motor 220/440 volts, 60-cycle, and a General Electric 3-hp. 220/440 volts, 60-cycle, were also part of the equipment used.

The mud pumps were a 20 by 7¾ by 20-in. Oilwell power pump, an Ideal 19½ by 7½ by 18-in. and an Acme 14 by 7¼ by 16-in. Two mud platforms and the mud manifold, all of the company's own design, were also used. A Martin-Decker Quintuplex was also used. A wire-line spooler was supplied by Patterson-Ballagh. The elevator links were 2⅞ by 108-in. Byron Jackson. For the first time anywhere, Continental Oil Co. used two rotary hoses, each 30 ft. long and coupled with a special built-in coupling. This hose, specially designed for Continental Oil Co., was engineer in Los Angeles and fabricated in Buffalo, N. Y. It is the first time two separate lengths of rotary hose have been used as a single unit as heretofore a single 50-ft. length has been the longest single hose used successfully. This jointed hose was tested to withstand a pressure of 6,000 lb. and by using two 30-ft. lengths it was only necessary to keep a single 30-ft. length on hand in case of emergency. Baash-Ross supplied a 3-in. pack-type bumper sub and 3-in. rotary jars used with the tester and rotary releasing sockets as a standby in case of mechanical trouble. One hexagonal and two octagonal kellys and bushings were used at one time or another during the drilling period. An American 1¼-in. Monitor steel wire line was used as was also a 1¼-in. Leschen wire line. Three 350-lb. Oilwell steam generators supplied the power for the rig, including a 9 by 10-in. vertical drilling engine equipped with a variable steam cutoff.

Above: Showing joints of drill pipe, telly and hose. Right: Here is 12,878 ft. of 6⅝-in. casing ready to be run. (No. 5-8-A Kern County Land, Continental Oil Co.)

Combination Degasser and Agitator

The well was equipped with a combination degasser and agitator perfected by Continental Oil Co. engineers during the past 2 years. This combination degasser and agitator was discussed in detail in The Oil and Gas Journal of March 21, 1940, page 63. An unusually large hole was carried from top to bottom. After cementing the 13⅜-in. surface casing, the company drilled an 11-in. hole to 1,756 ft., 10⅝-in. to 2,604 ft., 10¼-in. to 3,233 ft., 10-in. to 3,701 ft., 9¾-in. to 4,300 ft., 9½-in. to 5,198 ft., 9¼-in. to 6,060 ft., 9-in. to 6,496 ft., 8⅞-in. to 6,865 ft., 8¾-in. to 7,388 ft., 8⅝-in. to 11,039 ft. and 8½-in. to the bottom. Very little coring was done and the hole showed practically no deviation. Weight on the bit was held to two points for the entire job but the number of revolutions was reduced as the hole went down. Below 11,800 ft. the speed was maintained at a maximum of 100 r.p.m. At the start, a maximum of 250 r.p.m. was maintained down to about 2,500 ft., but this was cut to 225 r.p.m. to 3,500 ft. and reduced to 200 r.p.m. to 6,800 ft. The speed was then cut to 175 r.p.m. to 9,500 ft. and reduced to 150 r.p.m. between that point and 10,400 ft. From 10,400 ft. to 11,800 ft. the rotation was restricted to a maximum of 125 r.p.m. indicating a progressive slower rate of rotation with additional depth.

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Illinois Uses Several Explosives And Tamping Methods

(Continued from Page 82)

¼-in. screen) for part of the tamping. While some shooters do not like to see pea gravel used for tamping, this company has not had any failures with it and finds it has two advantages: safety from bridging even when it is shoveled into the hole and ease of bailing when cleaning out is started. The shots are kept from 15 to 20 ft. away from the casing shoe and the hole is kept filled with oil until the shot is discharged.

The same company also used the gypsum-cement tamp above a 4 or 5-ft. bridge of 1½-in. chat on top of the umbrella. A plug of about 30 ft. of gypsum cement is supplemented by filling the hole with oil; a 24-hour time bomb is used. The gypsum-cement tamp is always tested shortly after it has had time to set (2 hours) by running the bailer into the hole. Gas agitation of the quick-set gypsum cement will cause it to become a spongy mass and much of its effectiveness as a tamping medium will be lost.

Density of Shots

Production men in charge of shooting report they notice little difference in effect of shots on the several formations, Cypress, Paint Creek, Bethel (Benoist), Aux Vases, and others. The sands are generally very tight and will crack rather easily; and for this reason, as well as the mechanical limits, a comparatively light shot is used. A larger charge could easily defeat the purpose of the shot. Holes are loaded with amounts varying from 1 to 3 qt. per ft. Paul F. Lewis pointed out in his recent A.P.I. paper on shooting that "the rocks requiring the hardest shooting require the greatest practical loading density, and rocks requiring the lightest shooting require a proportionately less loading density. Because a stone drills hard it does not of necessity indicate the rock will require hard shooting, as soft stones have a low compressive strength and are quite elastic and consequently they will require harder shooting to overcome this elasticity and induce the desired fracturing."

While a number of "slim holes" have been drilled in Illinois, there is little tendency to use "springing," "chambering," or "squibbing" of the shots, i.e., creating a pocket or cavity by discharge of a small shot so a larger shot can be placed. Even in cases where proximity to the casing shoe called for caution, solidified nitroglycerin has been used with the bomb resting in it and the umbrella immediately on top of it. A few wells have been underreamed and the solidified nitroglycerin charge dumped into it.

Some companies always give their wells production tests before shooting and others shoot just as soon as the well has been drilled in and cleaned out. The former can accurately judge the effect of shooting and the effect of loading of the different densities. Production tests show that under the present practice of comparatively light shooting, an increase of 150 to 1,000 per cent is obtained. Cases where unusual increases in production have been obtained have been credited partially to conditions existing in the ground rather than entirely to the effect of the shot or the fragibility of the formation. The producing sands in Illinois frequently are partially or completely replaced by shots and fracturing of the rock may cause a well bottomed in a poorly productive shaly sand to have access to a nearby and purer sand body.

References

The Oil and Gas Journal, May 11, 1939, p. 49; November 30, 1939, p. 59; July 20, 1939, p. 34.

Left: Extension on valve on 6-in. line makes it possible to control the flow of oil despite high water. Center: High water on the Ohio River almost covers the valve used for normal loading of barges. Right: A 6-in. riser with four valves which allows loading of oil on barges at any stage of the river

High Water No Deterrent To Sohio Barge Shipping

SHIPMENT of oil by waterway has become of increasing importance to Illinois due to the congestion of pipe lines in the area and part of the pressure has been relieved through shipments up the Ohio River to refineries in Ohio, Kentucky and West Virginia. Nearly 10,000 bbl. weekly are shipped from terminals located in Indiana and western Kentucky. Recently Mount Vernon, Ind., was selected as the terminal for several pipe lines and the location of one refinery and possibly another. The site for the terminal was chosen because even during low water there is ample depth for the docking and loading of the oil barges. High water presents another problem as the river frequently floods the surrounding country, particularly in the spring of the year. This has made it necessary to install special facilities for loading the barges when water is high.

Normally, the barges are loaded through a 10-in. gravity line from the tanks located on a bluff near the river.

Flow of the oil is regulated by a valve close to the river's edge but during high water the valve will be covered with from a few feet to 25 ft. of water. As the shipping must go on regardless of river conditions, the Sohio Corp. has installed a vertical section of 6-in. pipe with four valves located at approximately 10-ft. intervals.

Extension for Valve

The valve for controlling the direction of the flow of oil has a 20-ft. vertical extension which makes its operation possible regardless of the height of the flood waters. Suspension bridges attached to trees near the river provide access both to the loading valves and to the master control valve. The installation of the loading rack used during flood stage was accomplished by installing a "Y" at the foot of the bluff about 50 ft. back from the river's edge at normal stage. A 6-in. valve was placed on this line.

The line was then run over to a group of trees where a 40-ft. riser with four valves evenly spaced on it was installed. The discharge of each valve was equipped with a nipple, an "L" and a half-union for coupling on the loading hose. Another control valve was installed at the bottom of the riser.

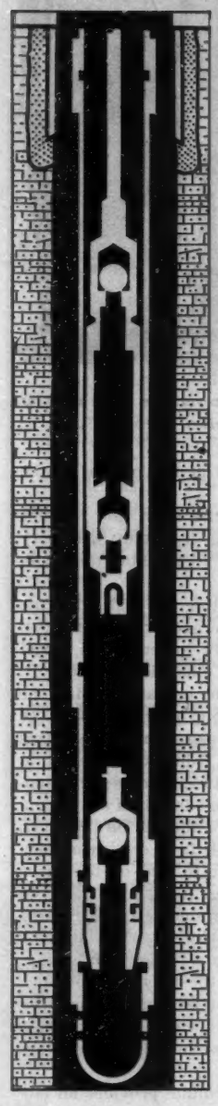
As the lower valve on the main line remains closed except when loading, it is only necessary to open the valve on the "Y" to allow the oil to get into the riser.

The extension for operating the valve on the "Y" is made from 2-in. pipe and braced with two more 2-in. pipes about 25 ft. in length. A wheel was also installed on the extension about 4 ft. above the valve so it can be operated during the medium flood stage without going out on the suspension bridge. The suspension bridge was made from guy wires and 1-in. board nailed to 2 by 4-in. boards. Large trees provide the support for the river end while 6-in. pipes set in concrete provide the support for the end on the bluff.

To load a barge with oil, it is only necessary to anchor the loading raft to one of the large trees and connect the loading hose to the valve on the riser just above the water level. The only defect so far has been due to the barges bumping the trees which support the suspension bridge from which the valves on the riser are operated. The rebound of the trees caused some of the wires to break. This will be prevented in the future by installing a bumping post or selecting another tree for suspension of the bridge.

As the Mount Vernon terminal provides an outlet for oil from the southeastern fields, including Griffin, Indiana-Illinois pool, the Storms and the Allen pool, any disruption of the loading facilities would cause these fields to be temporarily shut down. Two or three tow boats with their barges are loaded at the terminal weekly.

Left: Swinging bridge affords access to valve-wheel extension during high water. Stairs at right are used to get to controls during normal river stage. Right: Storage tanks are located on bluff close to river. The oil flows by gravity through lines into the barges



Tubing pump with gas valve in bottom of plunger and J-tool used for pulling standing valve

METALS in PRODUCTION

By W. L. NELSON

Balls, Seats and Polished Rods

In addition to 11 articles pertaining to metals used in drilling, The Journal has now published 2 articles on Metals in Production:

1. Strainers, Tubing, and Valves, March 14, 1940.

2. Oil-Well Pumps, March 21, 1940.

By these and future articles, it is hoped that the use of metallic materials in the entire petroleum industry may be discussed.

In spite of the large volume of information that is being published on metals, it is still a fact that specific recommendations for every service are lacking. The recommendations given herein, are those of recognized manufacturers of equipment and metallic materials—and are not necessarily the choice of the editorial staff of The Oil and Gas Journal.

Suggestions regarding additional alloys or steels for the services that are discussed, will be welcomed by the Metallurgical Editor.

TOOL-STEEL balls and seats have been used extensively in the past because of their relative cheapness. However, under corrosive conditions such a material may last no longer than 15 days.[41] Obviously, any saving in first cost or replacement cost that is offered by a cheap material that may last only 15 days, is false economy because the cost of pulling the rods and pump is exceedingly large compared with the initial saving in the cost of the valve material.

With the drilling of deeper wells and larger "pulling" costs, the need of more resistant materials became acute and such special alloys as stainless steel or iron, nitrided steel, Haynes Stellite, and alloy steels were adopted for many services. Some of these special-alloy materials for balls and seats are shown in the accompanying table. The maintenance of deep-well pumps becomes even more difficult as unconsolidated sands and corrosion are encountered—and particularly if encountered simultaneously. Chromium-plated balls and seats have also been tried but the application of the coating has been so often faulty that such balls and seats have not been adopted widely.[41] The extreme hardness of some of the materials now being used is emphasized in the following tables. The hardness figures are a general comparison rather than the particular heat-treated condition or hardness that is available in commercial ball-and-seat equipment.

In addition to the materials which are noteworthy because of hardness or resistance to abrasion, some materials are used because they are not magnetic and hence the valve will continue to function even if magnetic disturbances occur. Among the materials listed in the table, the following are not affected by magnetic force: Tobin bronze, stainless iron or steel, monel metal, and Haynes Stellite. It is also true that certain of the materials are useful because of their resistance to corrosion, examples of which are stainless iron or steel, monel, Stellite, etc.

Polished Rods

Although polished rods are situated at the surface of the ground and therefore can be replaced or repaired at relatively low cost, they have been studied fairly thoroughly. Perhaps this is due in part to the same reason, i.e., the ease with which studies may be made without molesting regular operations. In one respect the conditions under which polish rods must operate, is extremely severe. The rods are continually scraped or rubbed by the guides which hold the rod, and hence fresh metal is constantly exposed to corrosive action. This is a serious condition because most corrosion-resistant materials gain their passiveness by virtue of a thin film of tightly adherent corrosion scale. It has often been pointed out in this regard, that newly exposed stainless or chromium steels are attacked more rapidly than plain carbon steel but due to the protective nature of the chromium scale, the chromium steels are ranked as one of the outstanding types of material for withstanding sulfide corrosion. Yet in certain conditions, such as pump rods and the like, the stainless steels have not performed well.

APPROXIMATE SURFACE HARDNESS

	Brinell No.
1. Carbon struct. steel—heat treated	180
2. Gray cast iron	180
3. Gray alloy iron	240
4. Carbon tool steel—heat treated	250
5. S.A.E. alloy steels (0.4 carbon)—heat treated	350
6. Flame hardened—carbon steel	550
7. Alloy cast irons—sand cast (brittle)	600
8. Flame hardened—alloy steels	600
9. Flame hardened—manganese or vanad. steels	625
10. Haynes Stellite	625
11. Carbon steel—carburized	675
12. Alloy cast irons—chilled (brittle)	700
13. Alloy steel—carburized	725
14. Nitrided nitralloy	850
15. Xaloy (nickel boride hardener)	850
16. Chromium plate	...

Hardness is a good indication of wear properties but cannot be taken as a direct index of abrasion resistance. Some of the lower hardness materials shown in the tabulation last longer than the harder materials in wear and field tests.

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BALLS, SEATS, AND POLISHED RODS

Equipment—	Material—	Composition, per cent C	Mn	Ni	Cr	Mo	Others	Physical properties Yield point	Elong. in 2"	Brinell hardness	Notes—	Reference
Balls and seats	Carbon tool steel	0.5	...	...	...	...	...	79,000	18	230	Cheap, quenched, and tempered	41–44
	Carbon steel	0.2	...	...	...	...	...	65,000	20	.....	Carburized	41
	Tobin bronze	(60 Cu—39 Zn—1.0 Sn)						.....	...	.....	Nonmagnetic and corrosion resistant	41–44
	S.A.E. 2315	0.15	0.45	3.5	...	...	...	95,000	17	†640	Carburized	41
	Stainless iron	0.11	...	8.0	18.0	...	Si 0.75 Max.	.....	..	.....	Corrosion resistant	44–46
	Stainless steel	0.2-0.4	0.6	7.5	19.0	...	Si 1.2	.....	..	.....	Corrosion resistant	44–46
	K Monel metal	(A13.5)		63.0	(Fe 1.5)		Cu 30.0	.....	..	.....	Nonmagnetic and corrosion resistant	44–46
	Nitrided steel	0.25	0.5	...	1.1	0.25	Al 1.2	115,000	18	‡900 up	Quenched, tempered, and nitrided	44
	Haynes Stellite	(W 4.0)		...	28.0	...	Co 65.0	.....	..	530	Nonmagnetic, corrosion and wear resist.	51
Polished rods	S.A.E. 1020 steel	0.2	0.65	...	...	...	...	70,000	20	.....	.....	43
	S.A.E. 1050 steel	0.5	0.65	...	...	...	...	85,000	23	§59,000	Normalized, quenched, and drawn	11
	S.A.E. 4130 steel	0.3	0.65	...	0.65	0.2	...	95,000	30	§70,000	Normalized, quenched, and drawn	6–11
	S.A.E. T 1335 steel	0.35	1.7	...	...	...	...	90,000	15	.....	Normalized and cold drawn	43
	S.A.E. 4620 steel	0.2	0.5	1.8	...	0.25	...	94,000	25	.....	Quenched and tempered	46
	S.A.E. 30915 steel	0.12	0.5	8.0	18.0	...	(0.75 Si Max.)	82,000	25	.....	.....	43–46
	Monel jacketed S.A.E. 4615 steel	...	...	...	...	...	...	92,000	16	.....	(Tube cold drawn over steel)	21–43
	Monel metal	61.5 (23-32 Cu—3.5 Fe)						85,000	23	.....	Cold drawn	43
	Roman bronze	(60 Cu—39.25 Zn—0.75 Sn)						55,000	18	.....	Annealed and cold drawn	46
	Silicon bronze	(96.25 Cu—3.25 Si—0.5 Sn)						75,000	18	.....	Annealed and cold drawn	46

*The letters S.A.E. refer to the alloy steel specifications of the Society of Automotive Engineers. †Case only. ‡By Vickers Diamond Brinell with 10-kg. load. §Endurance limit.

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QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph. D., Technical Editor

Determination of Mercaptan Sulfur With Copper Oleate

I would like information on cupric oleate solution for testing cracked gasoline for mercaptan sulfur. Do you have any information along this line? What I am interested in is how to make this solution and how to standardize it so the factor will read in RSH lb./100 gal. I understand this solution is made in kerosene oil so it will be mescible in gasoline.—A. J. B.

The copper oleate method for mercaptans was suggested by G. R. Bond, Jr., who had observed that the gradual addition of a kerosene solution of cupric oleate to gasoline containing mercaptans was attended by decolorization of the dark green oleate solution and formation of a pale yellow precipitate, followed by a distinct green coloration in the solution upon addition of a slight excess of the oleate. The reaction involves the reduction of the copper to the cuprous form and formation of cuprous mercaptide, organic disulfide and liberation of fatty acid. Thus

$$4RSH + 2Cu(Ol)_2 = 2CuSR + R_2S_2 + 4H(Ol)$$

From this it follows that 1Cu ≏ 2S (as mercaptan).

The author describes in the original reference, the method for preparing the solution and its standardization.

"Cupric oleate.—Titrations were carried out with a crude cupric oleate solution prepared by exact neutralization of elaine oil with sodium hydroxide, precipitation in warm dilute solution with approximately the theoretical amount of cupric nitrate, and purification by washing the coagulated cupric oleate. This was found to give a material having a more intense color than that prepared from pure oleic acid. The solution was prepared with kerosene free from oxidation products to contain about 4 g. of copper per liter. Standardization was accomplished by shaking a given volume with dilute hydrochloric acid to remove the copper, which was then determined iodometrically. The standard solution is fairly permanent if kept in the dark, showing no alteration over a period of 3 months, and may be used as long as it remains clear and does not develop peroxides."

Elaine oil is known under several names. It is derived from wool fat by washing with water and treatment with sulfuric acid. It is difficult to obtain in pure form, so should be standardized against a known thiosulfate solution or follow the author's directions. Some of the other names for this product are wool odein, wool grease oil, Yorkshire oil and degras oil.

The method of analysis, as described by G. R. Bond, Jr., is:

"A definite weight or volume of the gasoline is placed in a glass-stoppered cylinder and the cupric oleate solution is added from a buret in small portions, with shaking. The end point is a pale green color, clearly visible even in the presence of considerable precipitate. It may readily be substantiated by filtering on an ordinary dry filter paper. Addition of 0.05 cc. of the oleate solution at the end point is sufficient to impart a distinct green tint to the gasoline when viewed in a layer of reasonable thickness. For a blank, a sample of the same type of gasoline should be sweetened—for instance by alcoholic caustic—and titrated to the same depth of color. This value usually ranges from 0.10 to 0.15 cc. of the oleate solution, and is subtracted from the mercaptan titration. The per centage of sulfur is then:

$$\frac{(\text{cc. Cu Ol} - \text{blank}) \times \text{g. Cu/cc.} \times 1.009 \times 100}{\text{weight of sample}} = \text{per cent mercaptan sulfur.}$$

References: G. R. Bond. Jr., Rapid Quantitative Determination of Mercaptans. Industrial and Engineering Chemistry. 5/257/1933.

Composition of Natural Gasoline With Vapor Pressures

What is the average composition of natural gasoline in hydrocarbons with the vapor pressures of each?—L. M. E.

There are so many grades of natural gasoline, classified today according to vapor pressure at 100° F., percentage evaporated on distillation at 140° F., and other properties, it would be quite impossible to say what the average composition of all natural gasolines would be.

Considering the 26/70 grade, that is 26 lb. vapor pressure and 70 per cent evaporated at 140° F., the following would probably be quite close to the average natural gasoline of this grade that is produced in Oklahoma.

COMPOSITION OF NATURAL GASOLINE

Hydrocarbon—	Volume composition, per cent	Vapor pressure, lb./sq. in. at 100° F.
Propane	1	172
n-Butane	30	59
Isobutane	7	74
n-Pentane	18	15
Isopentane	6	6
Hexane plus	38	4

Copper-Strip Corrosion Test

I have wondered when corrosion tests were first applied to gasoline and when the copper strip method began to be used.—S. P. H.

The first official mention of a corrosion test to be applied to gasoline was in the report of committee on Standardization of Petroleum Specifications, Bulletin No. 5, effective December 29, 1920:

"Corrosion test, apparatus.—A freshly polished hemispherical dish of spun copper, approximately 3½ in. in diameter.

"Making of test.—Place 100 cc. of the gasoline to be examined in the dish, and place the dish in an opening of an actively boiling steam bath so that the steam comes in contact with the outer surface of the dish up to the level of the gasoline. Leave the dish on the steam bath until all volatile portions have disappeared.

"Interpretation of results.—If the gasoline contains any dissolved elementary sulfur the bottom of the dish will be colored gray or black.

"If the gasoline contains undesirable gum-forming constituents, there will be a weighable amount of gum deposited on the dish. Acid residues will show as gum in this test."

The copper-dish method was found to be cumbersome and was soon replaced by the copper-strip method. As early as 1921 the strip method began to be used by some petroleum refiners. In October of 1922 the copper-strip corrosion test was generally adopted as the A.S.T.M. test in the form set forth in The Oil and Gas Journal, March 14, 1940, Page 58, "Copper-Strip Corrosion Test for Motor Benzol."

Compressibility of Gasoline Crude Oil and Other Liquids

Considering your discussion of my question in the February 1, 1940, issue of The Oil and Gas Journal, the following may be of interest.—L. E. D.

Regarding the compressibility of oil and gasoline, the following references may be considered: Locating Leaks in Casing-Head Gasoline Lines by M. C. Alcorn, The Oil and Gas Journal, September 21, 1939, Page 125. Water-Pressure Testing of Pipe Lines by W. R. Reed, The Oil and Gas Journal, September 21, 1939, Page 80. The Compression of Liquid Water by Robert C. Heck, Power, September 22, 1931, Page 422.

The subject usually has no practical value but sometimes it may be important. In reference No. 1 the author presents a formula for estimating the amount of leakage from the pressure drop. The compressibility of gasoline may be much greater than that of water but it may not have been taken account of in the formula.

In reference No. 2, the question might be asked: After the pipe is filled, how much water must be pumped into the pipe line to bring the pressure up to 1,000 lb. per sq. in. (disregarding the slight enlargement of the pipe due to the stress in the steel). If the bulk modulus of water is 300,000 lb. the compression would amount to 1/300 or about 45 gal. per mile of 8-in. pipe. This may be greater due to air entrained or in solution in the water.

In reference No. 3, the author states the compressibility of water at high temperatures must be taken into account when considering work done by boiler-feed pumps at high-pressure steam plants.

The U. S. Bureau of Standards made a long series of tests as reported in "Compressibility and Thermal Expansion of Petroleum Oils," 0°-300° F., Bureau of Standards Research Paper No. 244.

In this investigation crude oils were not included because of dissolved gases as methane but from the data given the bulk modulus of gas oil is approximately 200,000, and of gasoline about 100,000 lb. per sq. in. Evidently the compressibility of crude oil would be between these two values.

Plating of Metal Containers Not Required for Petroleum Products

Is any use being made in the petroleum industry of cans, or the containers which are plated with silver?—D. T. H.

The purpose of plating metal containers, such as cans and drums, with silver is to prevent action on the metal by fruit juices and other substances. Most cans are coated with tin with some lead, both of which when dissolved act as poisons. Long storage in tin cans often results in corrosion with spoilage of the contents. A substance like silver inhibits such action.

Petroleum, light liquids, oils and waxes have no action on metals so there is no need for special treatment of metal containers for petroleum products, in fact, petroleum products such as heavy oils, petroleum, wax and asphalt are well known as rust and corrosion inhibitors.

FIELD OPERATIONS

Summarizing the Week's Developments

OKLAHOMA—A small oil-pool opener was completed in the Langston district, Logan County. A gas area was opened in Seminole County. A well in the Byars pool, McClain County, flowed 1,500 bbl. in 12 hours, but another test on the northeast side of the pool was dry. A well in the Weleetka area, Okfuskee County, flowed 1,053 bbl. of oil in 9 hours. An oil pool was discovered in northwestern Lincoln County.

KANSAS—Work continues to increase in the Kansas field, with new operations in the Forest City basin contributing to the gain. The Rock pool in Cowley County, Orth pool in Rice County and Iuka pool in Pratt County were extended. A gas well in the Lyons area, Rice County, got out of control last Friday and still was blowing wild as the week closed.

TEXAS: Gulf Coast—An old gas well in the Spurger gas field when deepened became an oil producer flowing 500 bbl. per day. The West Beaumont field was expected to be extended 2,000 ft. by a Stanolind Oil & Gas Co. test.

Southwest Texas—The first Tertiary Wilcox pool in the district was opened in the Thomaston area in De Witt County. Other Wilcox tests were making satisfactory progress toward completion.

West Texas—Wildcat activity in Ector County, together with final completion of Continental Oil Co.'s discovery well in Crockett County for a gage of 840 bbl. in 12½ hours, were the week's features.

West Central Texas—New wildcat locations were reported in Stephens and Haskell counties and a field discovery was indicated in Jones County.

North Texas—The leasing campaign, which is following the Fort Worth syncline, has extended through Montague and Wise counties and is virtually to the city limits of Fort Worth in Tarrant County.

Eastern Texas—Gulf Oil Corp. is reported negotiating to purchase the H. S. Moss block and discovery well in Camp County which is still shut down with plug undrilled in the Pettit lime.

LA-ARK-TEX—A new field in eastern Vermilion Parish is the sixth pool opened in South Louisiana thus far this year. The new Olla pool in La Salle Parish, North Louisiana, has wells drilling on all sides of the discovery well. A Smackover lime test in Columbia County, Arkansas, was a failure.

MICHIGAN—The Holland Township pool recently opened was minimized in importance by the failure of three wells to produce. Another test in the area was then abandoned. The best well of the week was good for 900 bbl. initially. It was in the Redding pool in Clare County.

ILLINOIS—Devonian lime production in the Salem field was extended northerly to the southern part of Sections 16 and 17 in Township 2n-2e. Salem production fell off last week but the state increased its crude-oil output 2,686 bbl. per day.

Completions in All Fields

(Week Ended April 6, 1940)

	Oil	Gas	Dry	Total	1940 total comp. to date	1939 total comp. to date
N. Y., Pa., and W. Va.	68	9	7	84	1,038	856
Ohio	12	8	8	28	251	235
Indiana	3	2	1	6	92	41
Kentucky	2	0	4	6	98	158
Illinois	48	1	6	55	892	889
Michigan	16	0	14	30	368	298
Kansas	13	1	4	18	375	285
Oklahoma	14	1	12	27	461	472
Texas:						
North Central Texas	39	1	27	67	863	601
West Texas	38	0	3	41	617	505
Texas Panhandle	12	1	0	13	159	103
East Texas	3	0	0	3	80	171
East Central Texas	3	0	3	6	70	64
East Texas Border	2	0	0	2	16	21
Gulf Coast Texas	16	0	3	19	360	357
Southwest Texas	35	3	19	57	632	618
Total Texas	148	5	55	208	2,797	2,440
North Louisiana	11	1	1	13	153	128
Gulf Coast Louisiana	16	1	5	22	227	154
Total Louisiana	27	2	6	35	380	282
Arkansas	3	0	2	5	59	64
Montana	2	0	0	2	36	32
Wyoming	1	0	1	2	41	27
Colorado	0	0	0	0	6	3
New Mexico	5	0	0	5	194	159
California	18	0	2	20	274	250
Total United States	380	29	122	531	7,362	6,491
Total previous week	370	29	107	506		
Week ended Apr. 8, 1939	298	40	128	466		

Outstanding Fields—Highlights

(Week Ended April 6, 1940)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
K.M.A.	33	39	8	5,197	1,305	37,397
Wasson-Bennett	15	60	15	15,715	746	33,578
Ector County	19	69	9	7,246	2,055	50,000
Pecos County	3	19	0	0	1,250	32,296
Jones County	8	22	1	271	601	8,000
East Texas	9	13	3	121	26,007	396,897
OKLAHOMA						
St. Louis	4	17	1	261	875	30,500
Cement	5	18	0	0	298	6,575
Oklahoma City	2	14	1	997	850	102,500
KANSAS						
Bemis	2	7	1	350	280	6,950
Burnett	3	12	0	0	78	3,100
Silica	3	11	0	0	614	12,150
Trapp	2	10	0	0	498	14,700
NEW MEXICO						
Lea County	12	49	5	1,075	2,424	97,360
Eddy County	14	67	0	0	540	16,530
LA-ARK-TEX						
Cotton Valley, La. (deep)	3	4	0	0	157	14,520
Magnolia, Ark.	0	7	1	240	100	19,800
Golden Meadow, La.	3	13	0	0	69	10,100
MICHIGAN						
Freeman-Redding	1	9	1	960	149	13,687
Kent County	2	23	1	169	293	16,324
CALIFORNIA						
Montebello	1	12	0	0	361	19,550
ILLINOIS						
Salem	10	98	17	11,049	1,809	250,982
Louden	4	23	17	3,695	1,387	76,031
Other basin fields	56	244	14	2,893	3,596	90,971
Old fields	....	....	....	.....	.....	9,422
MISSISSIPPI						
Tinsley	4	8	4	2,220	35	8,490

Illinois, Indiana and Kentucky

By STAFF CORRESPONDENT

Salem Production Falls, but State Crude Output Increases

MATTOON, Ill., Apr. 8.—Illinois daily average production in the past week increased 2,686 bbl. to a total of 427,406 bbl. a day, but the continued decline in Devonian lime production caused a falling off in the Salem field of 4,721 bbl., bringing the production of that field to 250,982 bbl. a day. Louden produced 76,031 bbl. Other basin fields (which includes Centralia with its own Devonian lime orgy of drilling), increased their combined production over the previous week by 6,214 bbl. bringing the fields outside of Salem and Louden up to an average of 90,971 bbl. a day. The old fields of the state produced 9,422 bbl., a small increase over the previous week.

Salem field Devonian lime production was extended northward into Sections 16 and 17. In the southwest corner of Section 16 a 2,520-bbl. well was brought in following the close of the weekly completion report, and the west offset in the southeast corner of Section 17 was good for 1,680 bbl. a day.

Fifty oil wells, seven dry holes and one gas well made a total of 58 completions. The total initial production, based on actual production, some of it short-time flow, was 17,637 bbl. Of this the Salem field with 17 new oil wells, 11 Devonian lime wells and 6 from upper pays, showed an actual first-day production of 11,049 bbl. Seventeen new wells in the Louden field registered a total 24-hour production of 3,698 bbl.

The average initial production per well of the 11 Devonian completions in Salem showed a continued decline. Eleven wells were credited with a 24-hour total of 10,726 bbl. or an average 24-hour initial of 975 bbl. per well. A total of 182 Devonian lime wells in the field averaged 136,011-bbl. production in the past week or an average of 747 bbl. per well. A week previously 172 wells averaged 816 bbl. per well.

Texas Co. brought in six Devonian wells in one day in the Salem field after the close of the weekly completion report. No. 7 Corbin in Section 31-2n-2e was rated at 5,160 bbl. a day on the basis of a 3-hour flow of 645 bbl.; No. 29 Jett in SW SW Section 16 flowed 315 bbl. in 3 hours, rated at 2,520 bbl. a day; No. 12 Martin, SE SE Section 17, 210 bbl. in 3 hours, rated at 1,680 bbl. a day; No. 25 Hawthorne, SW SE Section 5-1n-2e, pumped 12 bbl. in 3 hours, rated at 96 bbl. a day; No. 13 J. Richardson, SE NW Section 5-1n-2e, flowed 60 bbl. in 3 hours, rated at 240 bbl. a day; No. 28 N. Young, Section 20-2n-2e, pumped 35 bbl. in 12 hours, rated at 70 bbl. a day.

In Centralia townsite field Joe Carroll's No. 1 Tate, Lot 15, Block 7, Second Home Terrace addition, flowed 1,050 bbl. in 24 hours after it was acidized with 1,000 gal.

Many Near Completions

Wiser Oil Co.'s No. 14 Weems, SE NW NW Section 33-2n-2e, Devonian pay at 3,409-97 ft., acidized with 5,000 gal., flowed 639 bbl. in 5 hours, but was still being tested; Magnolia Petroleum Co.'s No. 4 Mary Harley, NE NW NE Section 31-2n-2e, Devonian at 3,253 ft., total depth 3,380 ft., acidized with 5,000 gal., flowed 4,977 bbl. in 23 hours, still testing; Magnolia Petroleum Co.'s No. 99 J. H. Young, NE SW NW Section 28-2n-2e, total depth 3,507 ft., with 5½-in. casing set at 3,388 ft., acidized with 5,000 gal., flowed 64 bbl. per hour, testing; Magnolia Petroleum Co.'s No. 96 J. H. Young, SW NW SW Section 21-2n-2e, flowed 388 bbl. naturally while cleaning out, total depth 3,502 ft., testing; Shell Oil Co.'s No. 17-C Young heirs, SW NE SE Section 20-2n-2e, pumped 7 bbl. in 24 hours, total depth 3,454 ft., testing; Magnolia Petroleum Co.'s No. 95 J. H. Young, SE SE SE Section 20-2n-2e, pay at 3,398 ft., total depth 3,439 ft., flowed 95 bbl. in 24 hours while cleaning out, acidized with 1,000 gal., testing; Kingwood Oil Co. and Bell's No. 23 Shanafelt A, NE NE NE Section 20-2n-2e, Devonian lime at 3,338 ft., pay at 3,420 ft., good pay at 3,434 ft., water at 3,464 ft., total depth 3,475 ft., set 7-in. casing at 3,390 ft., waiting for cement to set; Nick Barbare's No. 2 Young heirs strip, SE cor. Section 20-2n-2e, shot with 120 qt. at 1,757-1,854 ft., swabbed 205 bbl. in 24 hours, will pump. Texas Co.'s No. 27 Kalkbrenner, NE cor. SE NE SW Section 5-1n-2e, Devonian pay at 3,391-3,423 ft., better pay at 3,423-33 ft., total depth 3,459 ft., acidized with 1,000 gal., flowed 539 bbl. in 24 hours through 1-in. choke, then shot with 90 qt. at 3,391-3,436 ft., cleaning out.

In White County Carter Oil Co.'s No. 1 Poole, SW NE NE Section 25-6s-8e, in the Irons pool, swabbed 489 bbl. in 16 hours from Hardinsburg sand at 2,521-45 ft.; will put on pump. Exchange Oil Co.'s No. 1 Angle Storms, NE NE NE Section 22-6s-9e, in the Storms pool, flowed 30 bbl. of oil and 30,000,000 cu. ft. of gas from sand at 2,226-55 ft.; it was shut in. Kingwood Oil Co.'s No. 1 Paul Martin, NW SW NE Section 13-7s-8e, was drilling at 4,366 ft.

In Wabash County Zephyr Drilling Co.'s No. 3 Cowling, SW NW SW Section 17-2s-13w, had pay at 2,463-72 ft., shot with 10 qt., swabbed 339 bbl. of oil in 24 hours; running tubing.

In Wayne County New Penn Development Co.'s No. 1 Emma Elliott and others, SW NW NE Section 35-2s-8e, swabbed 400 bbl. of oil in 64 hours, total depth 3,402 ft.; will put on pump. Spiller and others' No. 2 Felix, SW SW NW Section 20-3s-8e, total depth 3,344½ ft., flowed 49 bbl. in 2½ hours; will pump.

In White County New Penn Development Co.'s No. 1 McKyes, SE cor. NE NE SE Section 19-3s-8e, pumped 126 bbl. in 18 hours, testing, total depth 3,276 ft.

In Jefferson County Magnolia Petroleum Co.'s No. 1 Lettie Jones, NE NE NE Section 10-3s-2e, drill-stem test at 2,789-2,800 ft., in McClosky lime, open 1 hour, recovered 165 ft. of sulfur water and a show of oil, another test of 1 hour at 2,800-16 ft. recovered 150 ft. of sulfur water and no show of oil, drilling at 2,882 ft.

The Week's Completions

In Christian County A. Moore and others' No. 1 Meyers, SE SW SE Section 7-13n-1e, was dry and abandoned at 1,330 ft. Fredonia lime was topped at 1,295 ft.

In Clark County Benson & Martin's No. 1 Briscoe, NE cor. SW Section 29-11n-14w, of second principal meridian, was shot with 10 qt. at 293-326 ft., and is a gas well variously estimated good for 5,000,000 to 10,000,000 cu. ft.

Fayette County

In the Louden field, Fayette County, Carter Oil Co.'s No. 2 Huffman, SE SW SW Section 1-8n-3e, made a 30-bbl. well in Cypress sand at 1,515-35 ft. Carter's No. 3 Huffman, NW NE NW Section 12-8n-3e, was shot with 10 qt. at 1,478-81 ft., Cypress sand, and swabbed 72 bbl. Carter's No. 3 Taylor, SE NE SW Section 12-8n-3e, shot in Cypress sand at 1,512-15 ft., swabbed 120 bbl. Carter's No. 1 Ping, SE SW NE Section 16-8n-3e, shot with 20 qt. swabbed 198 bbl. Cypress sand was topped at 1,514 ft. and Paint Creek sand at 1,544 ft., total depth 1,604 ft. Carter's No. 2 Larrimore, SE NW NW Section 21-8n-3e, Paint Creek at 1,543-92 ft., shot with 60 qt., swabbed 222 bbl. Carter's No. 1 Dragoo, SW SE NE Section 23-8n-3e, Cypress sand at 1,490-1,537 ft., shot with 50 qt., swabbed 828 bbl. Carter's No. 8 McClain, NE SW NW Section 4-7n-3e, Cypress at 1,465-99 ft., and Paint Creek at 1,522-59 ft., shot with 80 and 10 qt., swabbed 336 bbl. Carter's No. 10 McClain, SW NE NW Section 4-7n-3e, Cypress top at 1,461 ft., Paint Creek stray at 1,540-69 ft., shot with 20, 10 and 10. qt., swabbed 450 bbl. Iri Rhynes' No. 3 Koberlin, SW NE SE Section 5-7n-3e, Cypress sand top at 1,477 ft., Paint Creek 1,551-76 ft., shot with 30 qt., pumped 112 bbl. Papoose Oil Co.'s No. 5 Owens, SW SW NW Section 8-7n-3e, Bethel sand at 1,560-76 ft., shot with 30 qt., pumped 115 bbl. Carter's No. 2 Carl Miller, total depth 1,590 ft., shot with 30 and 15 qt., swabbed 132 bbl. Carter's No. 10 McCormick, SE NW NE Section 18-7n-3e, shot with 60 qt. at 1,491-1,512 ft., Cypress sand; swabbed 390 bbl. Carter's No. 11 McCormick, NE SW NE Section 18-7n-3e, shot with 40 qt. at 1,503-16 ft., swabbed 174 bbl. Shell Oil Co., Inc.'s No. 8 Jedamski, SW NW SE Section 21-7n-3e, shot with 4 qt., in Cypress sand topped at 1,563 ft., pumped 74 bbl. Texas Co.'s No. 8 Wooten, SE SE SE Section 31-7n-3e, Cypress sand at 1,573-92 ft., pumped 147 bbl. without a shot. Texas' No. 3 Neathery, NE NW NW Section 6-6n-3e, Cypress sand top at 1,540-69 ft., not shot, pumped 147 bbl. Texas' No. 5 Yakel, SE SE SW Section 6-6n-3e, Cypress sand at 1,568-79 ft., not shot, pumped 148 bbl.

In Lawrence County J. W. Connor's No. 1 Zaner, SW SE SW Section 10-4n-11w, was dry and abandoned at 1,701 ft.; Fredonia lime topped at 1,578 ft.

In Richland County Pure Oil Co.'s No. 2 Campbell, C W½ SW SW Section 1-4n-9e, Fredonia pay at 2,885-88 ft., acidized twice with 5,000 gal. made only a 7-bbl. well. Pure's No. 1 Wasson, NE NE NE Section 27-4n-9e, Cypress sand at 2,593-2,609 ft., not shot, pumped 34 bbl. Dyson & Anders' No. 1 Ash, NW cor. SW Section 18-4n-10e. McClosky lime pay at 2,429-39 ft., acidized with 500 gal., pumped 58 bbl. of oil and 30 bbl. of water.

In Clay County Pure Oil Co.'s No. 1 Ross Travis, C E½ SE NW Section 32-3n-8e, dry and abandoned at 3,068 ft. It produced 3 gal. of oil per hour after two 5,000-gal. acid treatments. Pure Oil Co.'s No. 1 Gill, C W½ SW NW Section 34-2n-8e, McClosky lime at 3,050-53 ft., 3,074-77 ft., and 3,077-92 ft., acidized with 5,000 gal., pumped 62 bbl. of oil and 250 bbl. of water.

Marion County

In the Salem field, in Marion County, Magnolia Petroleum Co.'s No. 94 J. H. Young, NE SE SE Section 20-2n-2e, top of Devonian pay at 3,396 ft., total depth 3,445 ft., acidized with 3,000 gal., pumped 112 bbl. Tomberlin's No. 5 Young Strip, NW cor. NE SE Section 20, Devonian top at 3,345 ft., total depth 3,446 ft., acidized with 4,000 gal. and later shot with 100 qt. of nitroglycerin, swabbed 120 bbl.

Magnolia Petroleum Co.'s No. 97 J. H. Young, NW SW SW Section 21-2n-2e, Devonian pay at 3,436-62 ft., 5,000 gal, of acid, flowed 772 bbl. Magnolia's No. 35 W. B. Young, NW NW SW Section 21, Devonian pay at 3,450-95 ft., 3,000 gal, of acid, flowed 934 bbl. Texas Co.'s No. 22 D. Young-A, SW SW NW Section 21-2n-2e, pay at 3,420-65 ft., 5,000 gal. of acid, flowed 786 bbl.

Magnolia Petroleum Co.'s No. 39 Shanafelt, SE SE SW Section 29-2n-2e, pay at 3,340-68 ft., 5,000 gal. of acid, flowed 1,014 bbl. Magnolia's No. 40 Shanafelt, SW SW SE Section 29, pay topped at 3,386 ft., total depth 3,425 ft., 5,000 gal. of acid, flowed 367 bbl.

Texas Co.'s No. 21 Wayman, NW NE NE Section 31-2n-2e, McClosky lime at 1,918-32 ft. and 1,942-46 ft., 3,000 gal. of acid, pumped 100 bbl.

Texas Co.'s 26 A. McCollum, NE NW NE Section 32-2n-2e, pay at 3,366-3,414 ft., acidized with 5,000 gal., flowed 1,957 bbl. Texas' No. 8 Shereshoveck, NW SW NW Section 33-2n-2e, pay at 3,450-91 ft., 5,000 gal. of acid, flowed 302 bbl. in 3 hours, rated at 2,114 bbl. a day.

Wiser Oil Co.'s No. 13 Weems, NE NW NW Section 33-2n-2e, had Devonian pay at 3,443-75 ft., acidized with 5,000 gal., flowed 2,550 bbl.

Texas Co.'s No. 13 G. Johnson, NW SW SE Section 6-1n-2e, Benoist sand at 1,733-1,860 ft., shot with 105 qt., flowed 1,230 bbl. in 16 hours.

Wells completed in pays other than Devonian in the Salem field include Texas Co.'s No. 21 Wayman, NW NE NE Section 32-2n-2e, pumped 100 bbl. a day after a 3,000-gal. acid treatment at 1,918 to 1,946 ft.; Texas' No. 5 Lazaretti, C N½ SW SW Section 33-2n-2e, Mc-

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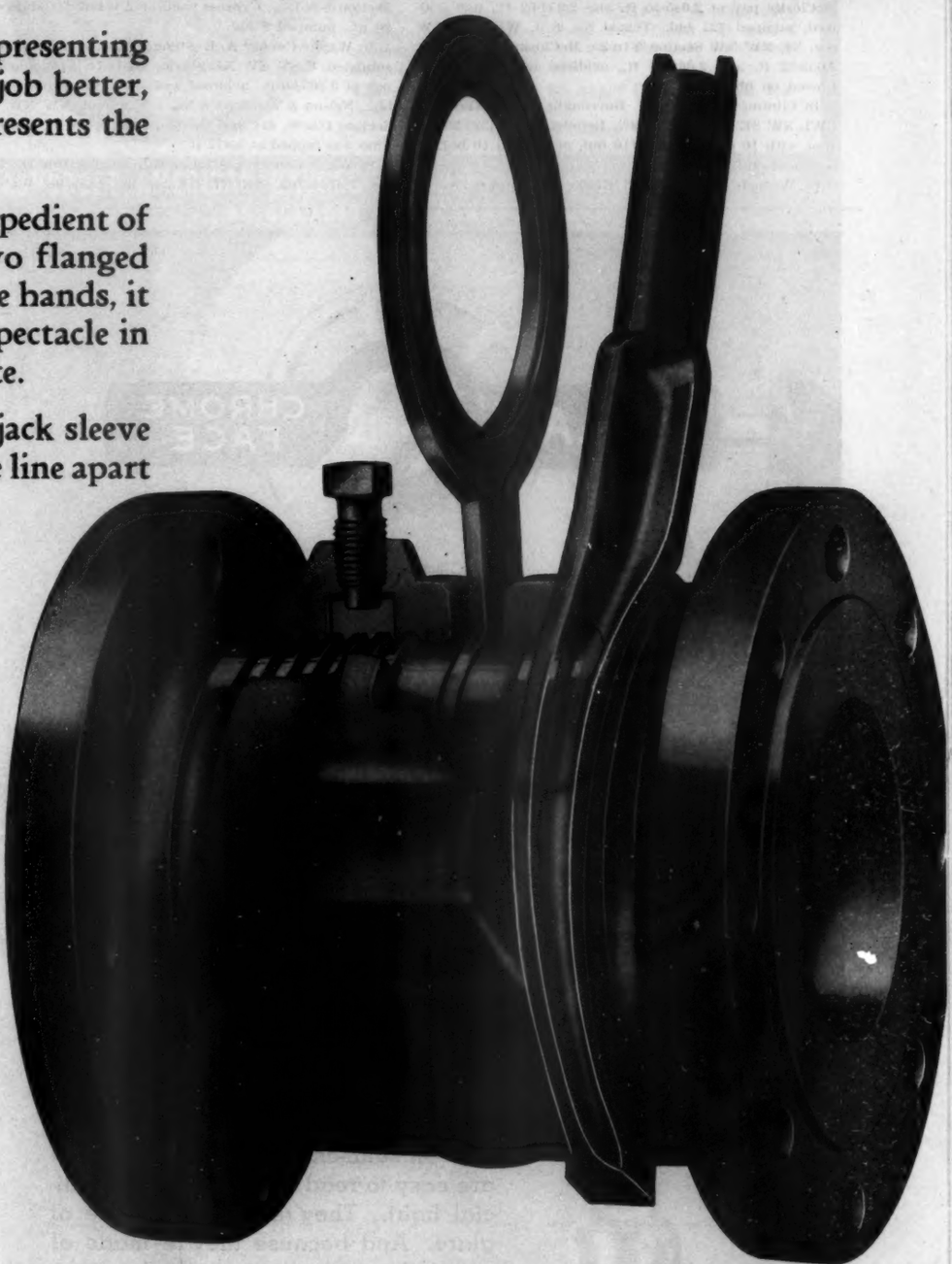

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Closky pay at 2,029-60 ft., flowed 315 bbl. a day following a 1,000-gal. acid treatment; Texas Co.'s 20 O. Johnson, SW cor. SE NW SW Section 4-1n-2e, Benoist sand at 1,811-42 ft., not shot, pumped 119 bbl. Texas' No. 6-C Reid-A, SW NE NW Section 5-1n-2e, McClosky lime pays at 1,914-18 ft. and 1,925-45 ft., flowed 336 bbl. naturally. Texas' No. 3 R. Murray, NE SE SW Section 7-1n-2e, McClosky pays at intervals from 2,053 to 2,092 ft., acidized with 2,000 gal., flowed 478 bbl. in 12 hours, rated at 840 bbl. per day. Texas Co.'s No. 46 City of Centralia land, NE NW NW Section 9-1n-2e, McClosky pay at 2,045-50 ft. and 2,054-62 ft., not acidized, pumped 721 bbl. Texas' No. 8 J. Williams, SW cor. NE NW NW Section 9-1n-2e, McClosky lime pay at 2,053-62 ft. and 2,068-74 ft., acidized with 2,000 gal., flowed 66 bbl.

In Clinton County O. W. Burroughs' No. 1 Knolhoff, CWL SW SE Section 2-1n-2w, Benoist sand 1,321-29 ft., shot with 10 qt., pumped 110 bbl. of oil and 10 bbl. of sediment and water.

In Wabash County H. T. Riddle and others' No. 1 Seibert, NE NE NE Section 4-1n-13w, McClosky lime top at 2,686 ft., total depth 2,743 ft., acidized with 2,000 gal., flowed 500 bbl. Continental Oil Co.'s No. 3 Cowling, NW NE SW Section 17-2s-13w, Cypress sand at 2,454-69 ft., shot with 20 qt., pumped 169 bbl. of oil. Continental's No. 1 Elliott, SW cor. NW NE SW Section 29-2s-13w, Cypress sand at 2,470-80 ft., shot with 15 qt., pumped 12 bbl. of oil and 5 bbl. of water. Tide Water Associated Oil Co.'s No. 5 Elkins, NW SW SW Section 29-2s-13w, Biehl sand at 1,720-32 ft., pumped 75 bbl. Continental Oil Co.'s No. 5 Schultz, SE cor. NE SE Section 8-2s-13w, Cypress sand at 2,424-37 ft., shot with 20 qt., pumped 8 bbl.

In Wayne County A. L. Stengel's No. 1 Withrow Consolidated, C S½ SW NE Section 34-1s-7e, Fredonia lime pay at 3,263-66 ft., acidized with 3,000 gal., pumped 199 bbl. Nelson & Strawser's No. 1 Vaughan, NW NW NW Section 1-3s-8e, dry and abandoned at 3,498 ft., Fredonia lime was topped at 3,472 ft.

In White County Exchange Oil Co. and Ohio Oil Co.'s No. 5 Rudolph, NE NE NE Section 14-6s-9e, Waltersburg sand at 2,258-83 ft., flowed 90 bbl. a day by heads. W. C. McBride, Inc.'s No. 1 O. Johnson, SE NW NE Section 25-6s-8e, in the Irons pool, was deepened from 2,538 to 2,544 ft. and shot with 10 qt., and it responded by pumping 459 bbl. of oil the first day. Shell Oil Co., Inc.'s No. 1 L. Austin, NW cor. SW NE NW Section 25-6s-8e, Hardinsburg sand at 2,482-2,507 ft., shot with 10 qt., pumped 211 bbl. J. W. Carter and others' No. 2 O. Johnson, NW NW NE Section 25-6s-8e, the discovery lease, Hardinsburg sand at 2,529-39 ft., shot with 10 qt., pumped 548 bbl.

In Williamson County Joe Bialock and others' No. 1 Hill, SW SW SE Section 4-9s-2e, was dry and abandoned at 1,630 ft. Clare sand was topped at 1,323 ft. Bialock and others' No. 1 Smathers, NE SE NE Section 9-9s-2e, total depth 2,562 ft., dry; plugged back to 1,371 ft., tested water, abandoned.

In Jasper County Mammoth Producing & Refining Co.'s No. 2 Johnoff, SW SW SW Section 24-5n-9e, was dry and abandoned at 2,995 ft. It had a showing of oil at 2,912-16 ft. in McClosky lime.

In White County Blackstock's No. 6 Storms, NW cor. SE NE NE Section 23-6s-9e, Waltersburg sand at 2,221 ft., total depth 2,262 ft., flowed 110 bbl. naturally.

New Wildcat Operations

In Montgomery County Henderson Brothers' No. 1 unnamed farm, 150 ft. from west and 300 ft. from north lines, NW SW NW Section 30-10n-4w, drilling at 451 ft.

In Effingham County Frank Mitchell and others' No. 1 Henry Zimbahlein, NW NE SE Section 26-9n-6e, was being rigged up.

(Continued on Page 107)

INDIANA

EVANSVILLE, Ind., Apr. 8.—Two wells were completed in Gibson County, good for 209 bbl. and 140 bbl. respectively; two gas wells, one good for over 15,000,000 cu. ft. per day, were brought in in Spencer County; an 80-bbl. well was Posey County's contribution, and a dry hole was abandoned in Ripley County.

Gibson County

In Gibson County Joe Bander and others had rig on the ground for No. 33 Cooper, C NE NE SW NE Section 24-3s-14w, and rig up for No. 32 Cooper, SE cor. SE NW NE Section 24. Papoose Oil Co.'s No. 4 Cooper A. had Cypress sand at 2,476-2,500 ft. and set 7-in. casing at 2,477 ft.

Joe Bander and others' No. 29 Cooper, NW SW NE Section 13-3s-14w, was shot with 10 qt. at 2,490-95 ft., and pumped 209 bbl. in 24 hours; a completion. O'Mara and others abandoned as dry No. 1 Maier, SE NE SW Section 21-3s-13w. Ste. Genevieve lime was topped at 2,763 ft. and the hole was bottomed at 2,984 ft. Papoose Oil Co.'s No. 2 Cooper C., NE NW SW Section 18-3s-13w, was completed. The well was shot with 20 qt. at 2,498-2,505 ft., and pumped 140 bbl. the first day.

Cherry & Kidd and others were rigging up No. 1 Dunn, SE SW NE Section 17-3s-14w. Walter J. Whitcomb will deepen No. 1 Charles Meade, SE cor. SW Section 12-1s-10w, which had been drilled to 1,462 ft. by another operator. A. L. Braden and others made a location for No. 1 C. Knight, 250 ft. from north and 300 ft. from east lines, SW SW Section 2-2s-11w. Sloss & Walters' No. 1 Oakland City College, NW cor. NE SE Section 13-2s-9w, topped Ste. Genevieve lime at 1,536 ft.; had a hole full of water at 1,655-73 ft., and was drilling at 1,730 ft. in a hole full of water. Midwest Development Co.'s No. 1 Brock, SE SW SE Section 10-2s-9w, was shot with 120 qt. at 1,346-88 ft., and pumped 15 bbl. of oil and 17 bbl. of water in 10 hours. It was not yet a completion. C. W. Sowell and others spudded with cable tools in No. 1 Schoonover, SW NE SW Section 13-3s-9w. A. L. Braden and others' No. 1 Simpson, NW SE NE Section 19-3s-11w, topped Ste. Genevieve lime at 2,480 ft. and had pay at 2,692-94 ft. and 2,695-96 ft. It was acidized with 1,000 gal. and a 25-bbl. oil load. Pumping equipment was being installed. A. J. Walker's No. 1 Schmidt, NW NE NW Section 24-3s-9w, was drilling below 150 ft.

Spencer County

In Spencer County Ohio Oil Co.'s No. 1 Holtzman, NE SE SE Section 28-4s-4w, topped New Albany shale at 2,030 ft. and was shut down at 2,060 ft. Rogers and others' No. 1 Miller, SE SE SW Section 32-6s-7w, spudded and shut down.

O. L. Sturbois and others' No. 2 Boyd, SW NE NE Section 31-7s-6w, had sand at 912-15 ft. and 450,000 cu. ft. of gas. Dry sand was drilled at 915-18 ft. and a showing of oil was had at 918-23½ ft., total depth. It

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had not been tested. Walter Duncan made a location for No. 1 Miller, NE SW NE Section 31-7s-6w. Kentucky Natural Gas Co.'s No. 2 Scamahorn, C SE NW Section 29-7s-6w, was being rigged up with standard tools.

Damron Refining Co. completed a 15,579,000 cu. ft. gas well in No. 1 Miller-Axton, C W½ NE SE Section 30-7s-6w, in sand at 908-21 ft. Kentucky Natural Gas Co. completed a gasser in No. 1 Scamahorn, C NE NW Section 29-7s-6w, in sand at 910-14 ft. It flowed 1,056,000 cu. ft. in 24 hours. Same company's No. 1 Hall, C SE SW Section 29-7s-6w, had sand at 650-60 ft. and 900,000 cu. ft. gas, but was drilling at 740 ft. Damron Brothers were rigging up No. 2 Kopp, 330 ft. from north and 400 ft. from west lines, of NE NE Section 19-7s-64w. Same operators had a small showing of oil at 350 ft. and were drilling at 700 ft. in No. 1 Frank, SE NE SE Section 35-7s-7w.

Posey County

In Posey County J. N. Roberts had cellar and pits dug for No. 1 Keck, 990 ft. from east and 2,170 ft. from north lines of NW Section 34-3s-14w.

Somer & Egan completed No. 3 Keck, SW cor. NW NE Section 34-3s-14w. It was shot with 10 qt. at 2,131-41 ft. and with 10 qt. at 2,148-58 ft. and made 80 bbl. a day on the pump.

Roberts Brothers' No. 4 Keck, SW NE NW Section 34-3s-14w, was shot with 20 qt. at 2,796-2,809 ft. and oil rose in the hole 1,800 ft. The crew was cleaning out. McBride Shirley and others' No. 1 Keck, NE NE

(Continued on Page 116)

OHIO

NEWARK, Ohio, Apr. 8.—Fourteen completions were made in the Ohio fields covered in this report, six gas wells, four oil wells, and four dry holes. In southwestern Ohio, the Sun Oil Co. is drilling at 105 ft. below the Trenton in Greene County, Caesars Creek Township, on the Dr. William Henry tract. Top of "Green" sand was had at 1,644 ft.; no water has been encountered to date. The deep tests in Muskingum and Knox counties are shut down.

In Gallia County, Cheshire Township, C. A. Cody's No. 1 James G. Swisher, Section 14, gaged 50,000 cu. ft. of gas in the second Berea at 1,667 ft.

In the Newark field, Licking County, Madison Township, Dowler Oil & Gas Co.'s No. 1 Lester Holtz, Lot 3, second quarter, had 100,000 cu. ft. of gas per day from Clinton sand at 2,709-39 ft. In Newark Township, Allen Willey and others' No. 1 Charles Spencer, northwest corner of the first quarter, had 700,000 cu. ft. of gas from the Clinton at 2,500-26 ft. G. C. Lacknette and others' No. 1 Orren Forrey, first quarter, gaged 1,056,000 cu. ft. of gas after drilling 18 ft. into the Clinton, top of sand at 2,443 ft. In Newark Township Ohio Fuel Gas Co.'s No. 2 Dewitt Hansberger, Lot 6, fourth quarter, was shot in the Newburg. Volume when shut in was 780,000 cu. ft., depth 2,168 ft.

In Medina County, Chatham Township, Edson & Son's Nos. 4 and 5 Sam Brandt, Lot 2, Tract 16, have been drilled in and shot but not connected to the

(Continued on Page 108)

WESTERN KENTUCKY

OWENSBORO, Ky., Apr. 8.—In one of the least eventful weeks of the past year in the western Kentucky fields one oil well was completed and four dry holes abandoned. The oil well was a 25-bbl. Jett sand completion in the Pattyville district in Henderson County. Following is the report of completed wells and new work started.

Butler County, Huntsville district: O. D. Vickers and Ross' No. 3 J. D. Heck, a location.

Daviess County, Maceo district: Jess Ashby and

(Continued on Page 120)

EASTERN KENTUCKY

ASHLAND, Ky., Apr. 8.—One oil-well completion is included in the report of activities in the eastern Kentucky field this week. J. Ray Eastin's No. 7 Marion Shoemaker, at Zoe, in the Big Sinking district of Lee County, is making 10 bbl. of oil daily.

In Morgan County Owens, Libbey-Owens, Gas Department is reported drilling on the Dolen Wilson land, 2 miles north of Grassy Creek postoffice.

Floyd Fitch is moving to the location of his second well on Williams Fork of Elk Fork. His first well was plugged back to the 725-ft. level in Maxon and the

(Continued on Page 104)

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Eastern Field Report

Deep Tests in Maryland and Pennsylvania Make Progress

By STAFF
CORRESPONDENT

PITTSBURGH, Pa., Apr. 8.—In Beaver County, Pennsylvania, John T. Galey and others on the James Tennis farm in South Beaver Township were drilling at 6,102 ft., with the top of the Lockport dolomite placed at 6,015 ft. The Newburg sandstone, which occurs in this formation, has not yet been reached, and as it occurs at a variable depth from the top of the Lockport, it is expected daily. The Newburg in Cuyahoga County, Ohio, is the source of a good gas pool. In Mercer County, Pennsylvania, the Newburg was saturated with a sour dark oil in uncommercial quantity. In Boone County, West Virginia, in 1939 in a test to the Clinton sand, the Newburg had an interesting gas volume. If present in this test it will be of geologic interest.

On Chestnut Ridge in Fayette County, Pennsylvania, the test of the New Penn Development Co., William E. Snee and others on the Piedmont Coal Co. lease in North Union Township is drilling at 6,854 ft., or 162 ft. below the top of the Onondaga lime. It should reach the Oriskany sand within the week. At present, the volume of gas from the Onondaga chert beds is holding steady at 1,800,000 cu. ft. a day which may be increased by Oriskany gas if it correlates with No. 1 J. H. Sorg, north of it.

During the past week in the lower eastern fields 25 operations were reported of which 7 were dry holes, 7 gas wells and 11 oil wells with a daily initial of 85 bbl., most of which was in Southeast Ohio.

SOUTHEAST OHIO

The best producer for the week was in Medina County, Ohio, where the Preston Oil Co. completed No. 3 M. H. Packard, Tract 19, Lot 27, Chatham Township, in Berea grit at 487 ft. It produced 45 bbl. the first day after a shot. In this township, Tract 10, Lot 3, Thornton Producing Corp. completed output wells Nos. 06, 08, 09, 012 and 14 on the Sanford and Watson farm at 424, 375, 401, 419, 370 ft. and they are good for 5 bbl. a day each from Berea grit.

In Jefferson County R. J. Braden Co. completed No. 2 Wiggington Brothers in the Steubenville city limits, Section 6, Cross Creek Township, in Berea sand at 1,560 ft., and it is dry. In SE Section 29, Saline Township, N. E. Ellis and others drilled No. 9 James A. Telfer through this formation to 1,288 ft. and it was dry.

In Monroe County Briggs Oil & Gas Co. completed No. 2 John B. Hogue in Section 19, Franklin Township, in First Cow Run sand at 851 ft. and it produced 2 bbl. the first day after shot.

In Muskingum County Palmer & Guisinger drilled a test on the Harriet Burton farm in NW Section 19, Harrison County, through Medina sand to 4,184 ft., and it was dry.

In Noble County Feliz Garat and others drilled a test on the John F. Hill farm, NE Section 15, Enoch Township, through the 500-ft. sand to 698 ft. There was a small showing of oil which may not be produced. In Section 11, Jackson Township, Wilbur Keith and others drilled a dry hole on the Ed Smith farm through the Keener sand to 1,255 ft. and it was dry.

In Perry County Hover Oil Co. completed the test on the Levi Griggs farm, SW Section 28, Jackson Township, in Berea sand, and it is a gas well gaging 500,000 cu. ft. a day from 945 ft. In this quarter section this company completed No. 1 William Poling in Berea at 905 ft. and it is good for 150,000 cu. ft. a day.

In Washington County J. L. Bachelor and others completed No. 2 Edgar and Belle Sheets, Lot 1098, Wesley Township, in the Peaker sand at 568 ft. It produced 6 bbl. the first day after shot.

SOUTHWEST PENNSYLVANIA

No wells were completed in Southwest Pennsylvania during the week. In Armstrong County, Plum Creek Township, Peoples Natural Gas Co. is drilling at 1,520 ft. in No. 1 Frank Smith; Equitable Gas Co. at 924 ft. in No. 1 Agnes Prugh; Shelocta Gas Co. at 1,346 ft. in No. 1 Virginia Schaeffer; T. W. Phillis Gas & Oil Co. at 2,614 ft. in No. 1 James Cessnar.

In Cowanshannock Township, Armstrong County, Peoples Natural Gas Co. is drilling at 2,935 ft. in the A. S. Rearick test and at 420 ft. in No. 2 Lee Bell. In Boggs Township Humphries-Stone-McCall Corp. is down 1,900 ft. in No. 1 W. A. Dill. In Kittanning Township John Wray is drilling at 2,360 ft. in No. 1 Benjamin Miller and Equitable Gas Co. is rigging up No. 1 Alice Boyer. In Kiskiminitas Township Chestnut Ridge Gas Co. will deepen No. 1 E. J. Shirey. In South Buffalo Township W. A. Baker is testing at 2,800 ft. in No. 1 James Bush. In Wayne Township Penn-Wayne Gas Co. has reached 3,100 ft. in No. 1 Seymore Paunch.

Clarion—Indiana—Westmoreland

In Porter Township, Clarion County, T. Swartzfager and others shut down at 2,900 ft. on the C. A. Swartzfager farm after getting water at 2,600 ft. T. W. Phillips Gas & Oil Co. is drilling at 1,980 ft. in No. 3 T. C. Blair. In Red Bank Township Apollo Gas Co. is shut down at 1,130 ft. in No. 3 Susan Keck.

In Indiana County T. W. Phillips Gas & Oil Co. is building rig on the George Smolar farm in Brush Valley Township. In Center Township this company is rigging up on the R. & P. Coal Co. lands. In Washington Township same company is drilling at 3,175 ft. in No. 2 M. M. Spence, with rigs on the ground for tests on the E. B. Brandon and Louise Black farms. In White Township this company is drilling at 1,485 ft. in No. 1 H. W. Leech and at 1,594 ft. in No. 1 J. J. McSlain. In Young Township Phillips is building a rig on the R. & P. Coal Co. land.

In Westmoreland County Apollo Gas Co. is drilling at 1,910 ft. in No. 1 D. M. Jones heirs in Allegheny Township.

Fayette—Green

In Fayette County Greensboro Gas Co. placed the Fifth sand at 2,366-2,437 ft. in the test on the Hicks & Holland lease, with 178,000 cu. ft. of gas a day showing at 2,369-72 ft. The tools are now at 2,528 ft. In Nicholson Township this company is drilling at 845 ft. in No. 1 S. Kopsey and at 120 ft. in No. 1 Emmet Diamond. Here Duquesne Gas Co. is drilling at 738 ft. in No. 1 Mary Durr. In German Township Wahler Powers Oil & Gas Co. is drilling at 240 ft. in No. 1 Feliz Valerio.

In Greene County A. V. Lewis and others made a location on the Smith & Pethtel lease in Jackson Township. In Monongahela Township Judson Bell and others started drilling No. 1 Samuel Black. In Richhill Township O. I. Dilie and others are drilling at 2,200 ft. in the Madison Hughes test. In Greene Township Equitable Gas Co. is down 1,865 ft. in No. 2 Hugh Keenan.

Washington County

In South Franklin Township, Washington County, Burleigh Wright and others are drilling at 2,525 ft. in the Holmes Andrews test. Union Gasoline & Oil Corp. started drilling No. 829 C. T. Conn.

In West Deer Township, Allegheny County, Walters and others are drilling at 900 ft. in No. 2 John H. Flick and Robert Marshall was drilling at 600 ft. in No. 4 William Rittman. In Middlesex Township, Butler County, Larkin and others have rig up for No. 2 G. Jeuther.

Deep Tests

In Maryland New Penn Development Co., William E. Snee, and others regained the old hole lost at 4,647 ft. on the Humberson farm on the Accident dome in Garrett County, and regained bottom and are now drilling at 5,578 ft. On Laurel Ridge in Stewart Township, Fayette County, Pennsylvania, these operators and E. G. Mueller are drilling at 6,626 ft. on the Gregg L. Neel farm. Tully lime, if present, should be reached soon. On Chestnut Ridge in South Union Township, Peoples Natural Gas Co. has rig up for the Piedmont Coal Co. well just south of Route 40.

WEST VIRGINIA

Three small oil wells were completed in West Virginia during the week. In Lincoln County Sand Creek Oil Co., Inc.'s No. 1 J. L. Caldwell, in Harts Creek district, which had been a gas well in the Big lime at 1,500 ft., began producing oil and is now making 3 bbl. a day.

In Pleasants County James E. Fell and others completed No. 2 Ralph Williamson in Union district in Squaw sand at 1,780 ft. and it is good for 2 bbl. daily.

In Wood County C. C. McPeek completed a test on the R. S. McPeek farm in Walker district in Cow Run sand at 1,044 ft., and it is a 2-bbl. pumper.

Gas Wells

In Clay County the Elk River Gas Co. completed No. 14 John W. Brown in Pleasant district in Berea sand at 2,431 ft. and it has a volume of 174,000 cu. ft. a day.

In Marshall County Hazlett Brothers and others drilled a test on the Stella McHenry farm in Franklin district through the Second stray sand to 1,135 ft. and it was dry.

In Putnam County the Laywell Gas Co. completed the test on the Ella Johnson and others farm in Curry district at 2,146 ft. with the Big lime at 1,397-1,576 ft.; Big Injun, 1,620-50 ft.; Berea, 2,097-2,121 ft., and a volume of 82,000 cu. ft. a day 36 hours after shot.

In Roane County the Big Spring Branch Oil & Gas Co. drilled a test on the Ethel Cox farm in Harper district through the Salt sand to 1,808 ft. and it was dry.

In Wayne County the Industrial Gas Co. completed the test on the Floyd Mullins farm in Union district at 2,940 ft. with the Big lime at 1,295-1,365 ft.; Big Injun, 1,365-1,640 ft.; Berea, 2,105-45 ft.; Brown shale, 2,640-2,904 ft., and a final gage of 250,000 cu. ft. a day 12 hours after shot.

Oriskany Gas Field

In Kanawha County two Oriskany gas wells were completed. In Poca district the United Carbon Co. completed No. 816 Louisa E. Long at 5,051 ft. with the Corniferous lime topped at 4,902 ft.; Oriskany, 5,008 ft.; final gage, 3,694,000 cu. ft. a day. In this district the United Fuel Gas Co. is completing No. 4863 Mary E. Carney and others with the Corniferous lime at 4,823 ft.; Oriskany, 4,936 ft., and a volume of 4,102,000 cu. ft. a day at 4,976 ft. and still drilling.

In this district the final gage of the Columbian Carbon Co.'s No. 1 Ida B. Mairs was 6,367,000 cu. ft. a day, with a total depth of 4,990 ft. In Elk district the same company's No. 1 Leonard C. Hanna gaged 3,180,000 cu. ft. a day from 4,924 ft.

In Poca district the following wells are drilling: United Fuel Gas Co.'s No. 4864 W. J. Glass and others at 3,754 ft.; Godfrey L. Cabot, Inc's No. 4 Putnam Co. at 2,674 ft., and No. 3 J. T. Bonham at 350 ft.; United Carbon Co.'s No. 824 Rosie Scott at 1,680 ft. and No. 825 W. C. Woodall and others at 1,751 ft.; Columbian Carbon Co.'s No. 1 V. E. King and others at 1,782 ft. and No. 1 Joseph Hughart at 1,511 ft.; West Virginia Gas Corp.'s No. 0-39 Leon Jones at 1,940 ft.; William O. Ziebold's No. 1 Hattie E. Clark at 1,900 ft.

West, Central and Panhandle Texas

By D. H. STORMONT

New Pool in Crockett County After 15 Years of Exploration

MIDLAND, Tex., Apr. 8.—Wildcat tests throughout Ector and Andrews counties, together with the completion as a significant field opener of Continental Oil Co.'s No. 2 Todd unit in Crockett County, drew the attention in the West Texas district during the week. In extreme northwestern Ector County, M. A. Grisham's No. 1 Cowden, Section 4, Block 45, Township 1n, T.&P. Survey, was last reported coring ahead below 5,855 ft. Considerable attention was centered on the wildcat early in the week when a core from 5,782 to 5,800 ft. showed full recovery of lime with slight stains of oil. No further shows were encountered in coring to present total depth. Geologists are of the opinion that the test is nearing the Tubb pay zone. The Holt horizon, the original objective of the wildcat, has been drilled through without identification, according to geologists.

Another Ector County wildcat drawing attention was Ralph H. Gill's No. 1 J. E. Parker, Section 12, Block 45, Township 2s, T.&P. Survey, 2½ miles west of the Harper field. Even though it is now shut down for orders at 5,505 ft., 5 ft. below contract depth, it is reported it may be deepened. During the week zones with slight oil showings were found at 5,270-80 ft., 5,300-10 ft., 5,340-50 ft., 5,410-30 ft., 5,308-11 ft., and 5,405-10 ft. The projected Holt horizon was believed to have been within this 150-ft. section of broken saturation. The test may be recontracted to the deeper zones.

Andrews County

With the starting of another wildcat, Andrews County now has three closely watched outside wells. The new operation is Helmerich & Payne, Inc.'s No. 1 University, 660 ft. from the north and east lines of Section 11, Block 11, University Lands Survey, 2½ miles northeast of the active wildcat by Richmond Drilling Co. and Tom Hunter in Section 21 of the same block and survey. The new wildcat is contracted to 5,500 ft.

Meanwhile Richmond & Hunter's test continues to drill deeper. Contract depth of 5,400 ft. was reached about the middle of the week and it was immediately recontracted to a new depth of 5,900 ft. It is bottomed at 5,402 ft. without having encountered any showings of oil or gas. The deepening will commence immediately.

Expected to commence soon, Illinois Oil Co.'s No. 1 University, Section 14, Block 12, University Lands Survey, several miles northwest of the new operation, is still drilling additional water wells. It was spudded some time ago and shut down for lack of water.

Ward County

A new wildcat test in Ward County, 1½ miles west of production on the University of Texas land in the south end of the North Ward pool, has been staked by Atlantic Refining Co. as No. 1 Wichett-University. Location is 1,980 ft. from the north and east lines of Section 12, Block 16, University Lands Survey. It is contracted to 3,500 ft. The test is 1½ miles northwest of a failure by Texas Co. at 3,059 ft.

Crockett County

Flow of 840 bbl. of oil in 12½ hours, official gage, was recorded for Continental Oil Co.'s No. 2 Todd unit, newest and most important discovery in West Texas in some time. The discovery, located in Section 29, Block W.X., G.C.&S.F. Survey, 15 miles northwest of Ozona, drilled its pay in a crinoidal lime of lower Pennsylvanian, identified, although not conclusively, as the Strawn series. The discovery marks the culmination of about 15 years of exploration and the expenditure of about $1,000,000 by four different companies. It is located on the 47,808-acre Todd ranch and is the fourth deep test to be sunk in the area.

Surface geology was worked by the Marland Oil Co. in 1925. Gas production was found at 1,600 ft. in 1926 by Continental Oil Co., successor to Marland Oil Co., and the following year some oil production was opened from the same zone. Stanolind Oil & Gas Co. drilled an 8,041-ft. failure in 1932 and in 1937 Superior Oil Co. drilled a 7,948-ft. failure. Continental Oil Co. abandoned its No. 1 Todd unit at 7,010 ft. late in January of this year and due to approaching lease expiration started the No. 2 Todd unit which opened the field.

WEST TEXAS FIELD COMPLETIONS

(24-hour gages)

Andrews County

In the Means field Humble Oil & Refining Co.'s No. 77 J. S. Means, 4,470-4,520 ft., 1,015 bbl.

Crane County

In the McCamey field Texas Co.'s No. 2 King, 2,362-90 ft., 36 bbl., old well drilled deeper. Texas Consolidated Oil Co.'s No. 6 Hughes, 2,166 ft., total depth, 3½ bbl. oil and 24 bbl. water daily, old well drilled deeper.

Ector County

In the Foster field Atlantic Refining Co.'s No. 3-E Johnson, 4,120-4,250 ft., 523 bbl. Broderick & Calvert's No. 21 Witcher, 3,970-4,170 ft., 770 bbl. Texas & Pacific Coal & Oil Co.'s No. 2 Johnson, 4,140-4,280 ft., 884 bbl.

In the Goldsmith field Gulf Oil Corp.'s No. 261 Goldsmith, 4,150-4,208 ft., 2,094 bbl. Gulf Oil Corp.'s No. 263 Goldsmith, 4,152-4,202 ft., 341 bbl. Phillips-Pure's No. 75 C. Cowden, 4,137-63 ft., 135 bbl.

In the Jordan field, Kewanee Oil Co.'s No. 5-B University, 3,500-75 ft., 1,759 bbl.

In the North Cowden field Texas Co.'s No. 1 O.B. Holt, 4,347-4,430 ft., 334 bbl. Rhodes, Tompkins & Richmond Drilling Co.'s No. 1 J. L. Johnson, 4,078-4,187 ft., 406 bbl.

Gaines County

In the Seminole field Amerada Petroleum Corp.'s No. 3-A Riley, 5,113-5,330 ft., 718 bbl. Magnolia Petroleum Co.'s No. 2-195 H.&J., 5,120-5,242 ft., 551 bbl. Osage Drilling Co.'s No. 1-A Tippett, 5,115-5,344 ft., 670 bbl. Osage Drilling Co.'s No. 1 Glenn Crain, 5,330-56 ft., 627 bbl., old well drilled deeper.

Howard County

A wildcat, M. L. Richards' No. 1 J. A. Shaffer, dry and abandoned at 3,058 ft after topping anhydrite at 840 ft., Yates at 1,233 ft., solid lime at 2,353 ft. In the Chalk field Sinclair Prairie Oil Co.'s No. 66 Dodge, 2,565-2,804 ft., 124 bbl.

Lynn County

A wildcat, Guthrie Lake Oil Co.'s No. 1 Mary L. Shoe, dry and abandoned at total depth of 802 ft.

Pecos County

In the Masterson field General Crude Oil Co.'s No. 1 Masterson, abandoned location.

Scurry County

In the Sharon field, Helmerich & Payne, Inc.'s No. 4 Martin, 2,238-2,515 ft., 75 bbl. Mudge Oil Co.'s No. 1 Grace Holcomb, 2,267-2,485 ft., 165 bbl.

Ward County

In the Payton field Edwards, Moore & Donnelly's No. 2 Reynolds, 1,842-92 ft., 485 bbl. Lynch's No 1 Miller, 1,929-42 ft., 123 bbl.

In the Estes field Gulf Oil Corp.'s No. 129 O'Brien, 2,785-2,885 ft., 82 bbl.

In the Magnolia-Sealy field Magnolia Pet. Co.'s No. 4-43 Sealy, dry and abandoned after topping anhydrite at 1,810 ft., solid lime at 2,515 ft. and Yates at 2,624 ft., total depth 2,935 ft.

Upton County

In the McCamey field Harvey, Sergeant & Rutter's No. 10-A Cordova-Union, 2,220-70 ft., 407 bbl. Humble Oil & Refining Co.'s No. 9 Reese, 2,592-2,679 ft., 733 bbl. Texas Pacific Coal & Oil Co.'s No. 2-D Lane, 2,462 ft. total depth, 11 bbl., old well drilled deeper.

Winkler County

In the Emperor field Sam Weiner's No. 2 Jenkins-Continental, 3,358-3,410 ft., 145 bbl. C. V. Lyman's No. 1 E. W. Cowden, 2,750-3,000 ft., 648 bbl.

Yoakum County

In the Wasson field Aloco Oil Co.'s No. 2 Knight, 4,945-5,270 ft., 815 bbl. Anderson-Prichard Oil Corp.'s No. 4-805 Spearman-Willard, 4,900-5,170 ft., 1,718 bbl. Argo Oil Corp.'s No. 5-A Comer, 5,015-5,215 ft., 984 bbl. Basin States Oil Corp.'s No. 3 Jordan, 4,960-5,210 ft., 508 bbl. Continental Oil Co.'s No. 3-867 Kendrick, 5,015-5,130 ft., 1,717 bbl. Honolulu Oil Corp.'s No. 3-890 Hovencamp, 4,922-5,080 ft., 1,765 bbl. Honolulu Oil Corp.'s No. 9-824 Wilder, 4,989-5,145 ft., 964 bbl. Humble Oil & Refining Co.'s No. 2-B Stanford, 4,903-5,125 ft., 137 bbl. Oil Development Co.'s No. 3-763 fee, 4,960-5,215 ft., 629 bbl.

Oil Development Co.'s No. 5-763 fee, 4,880-5,215 ft., 668 bbl. Oil Development Co.'s No. 11-803 fee, 4,880-5,215 ft., 1,599 bbl. Olson Oil Co.'s No. 6 Oil Development, 4,950-5,190 ft., 1,826 bbl. Osage Drilling Co.'s No. 6 Clawater, 5,025-5,235 ft., 967 bbl. Osage Drilling Co.'s No. 4 Lynn, 5,090-5,200 ft., 116 bbl. Shell Oil Co., Inc.'s No. 2-E Baumgart, 4,925-5,185 ft., 1,311 bbl.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Apr. 8.—The staking of new wildcats, one each in Stephens, Jones and Haskell counties, together with a possible new field in Jones County and renewed development in Coleman County's Novice field, held the attention of the week in the West Central Texas district.

About 7 miles northwest of Breckenridge and some 5 miles south of the recent 3,500-ft. failure drilled by Ed McAdams on the Sloan tract as a south outpost to the Stribling field, a new deep wildcat is scheduled to commence in the near future. It is Guy Ewing's No. 1 Crudington. SE cor. T.E.&L. Survey No. 1,268.

Attracting attention in Stephens County was a test in the townsite of Breckenridge which reported a top of the Ellenburger lime at 4,354 ft. It is Pitzer & West's exploratory well located a block east of the First Christian Church. Being drilled as a twin well to the old Gonzolus producer, it was last reported below 4,415 ft., in the Ellenburger lime.

Haskell County

The field opener in Palo Pinto lime in southern Haskell County, K. B. Nowles' No. 1 A. E. Pardue, Section 1, S.F.&W. Survey, Abstract 475, has been given a ½-mile north outpost as the first operation since the field's discovery late in February. The new test is S. B. Roberts' No. 1 Pardue, 80-acre tract out of the Pardue ranch just north of the discovery well. The field opener made 35 bbl. daily from the lime drilled from 3,398 to 3,404 ft. after plugging back from 3,438 ft. and acidizing with 2,000 gal.

Jones County

Jones & Stasney of Albany have staked a new Palo Pinto lime wildcat in Jones County a mile north of the original Avoca field in the northeast corner of the

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Texas and Louisiana Gulf

By NEIL WILLIAMS

Sixth New Pool in Coastal Louisiana Thus Far in 1940

HOUSTON, Tex., Apr. 8.—The Erath prospect, eastern Vermilion Parish, was added to the list of producing fields in coastal Louisiana as Texas Co. completed No. 1 Vermilion Parish School Board for an estimated production of 300 bbl. of 41-gravity oil per day, flowing through a 12/64-in. choke under a tubing pressure of 3,300 lb. The well was drilled to 11,762 ft., plugged back to 11,414 ft., and the completion was made through perforated casing at 11,378-88 ft.

The field is in Section 16-13s-4e, approximately 4 miles southwest of the town of Erath. The area has been looked upon as a favorable prospect for several years and has been checked at various times with geophysical instruments, by several companies. Most of the acreage around the well is controlled by Texas Co., although within recent weeks several major companies and independents are reported to have purchased considerable protection acreage. The structure is expected to cover a large area and an electrical survey is reported to have shown several possible sands below 10,000 ft. The discovery is the sixth pool opened in South Louisiana this year, all within the past few weeks.

Possible production from new sands has revived interest in the Barataria field, Jefferson Parish. Carter, Perrin & Brian's No. 1 Reutley Wiseman topped a broken shale and sand section showing oil at 8,775 ft., and the well is coring below 9,671 ft. An electrical survey showed oil sand at 8,770-8,805 ft., with the top 28 ft. the best part of the section, while another sand was indicated at 8,830-71 ft. The well is believed to be running about 50 ft. higher than the discovery well, 1,000 ft. north. This well was drilled deeper after it failed to log the discovery sand at 8,200 ft. East of the discovery well California Co.'s No. 1 State Bayou Barataria is bottomed at 8,226 ft., and an electrical survey showed broken sand with a show of oil at 8,195-8,215 ft. and indicated that the well had cut a fault at 7,950 ft. The well was drilled directionally so that the bottom of the hole was to be in the center of the bayou.

Continental Oil Co.'s No. 1 Niblett Farms, completed the previous week to open a new field in the Hayes area, Jefferson Davis Parish, flowed 100 bbl. of net oil and 20 per cent wash water per day. Tubing pressure was 2,700 lb. During the 24-hour gage the well was tested for 14 hours on a 9/64-in. choke and 10 hours on a ⅛-in. choke. The well is flowing through perforated casing at 11,604-24 ft.

On the southwest flank of the Anse La Butte dome, St. Martin Parish, Glassell & Glassell's No. 1 A. Moresi topped salt at 5,825 ft., and the formation was drilled to a total depth of 5,839 ft. An electrical survey showed oil sand at 4,675-4,806 ft., with 80 ohms resistivity and from 110 to 150 mv. porosity on the fourth curve. Casing is being cemented for a production test.

Mikton Oil Co.'s No. 2 Martinez, southeast of the discovery well of La Fourche Crossing field, La Fourche Parish, perforated casing at 10,036-38 ft., and on a drill-stem test through a ⅞-in. choke top and bottom the well blew wet gas and tested 3,240 lb. of working pressure. The perforations were squeezed off to retest.

In Acadia Parish Vicent & Welch's No. 1 Ruppert recovered 7 stands of drilling mud with a slight show of oil on a 45-minute drill-stem test at 3,505-15 ft., and the well is now shut down. It is in Section 21-7s-1w, east of the Tepetate field.

Shell Oil Co., Inc., is preparing to retest No. 4 Jeanerette Lumber Co., West Lake Verrett field, St. Mary Parish, after the well flowed 34 bbl. of distillate and 5 bbl. of salt water in 21 hours through a 10/64-in. choke. The production test was made in a new sand through perforated casing at 11,348-53 ft.

Locations for two wells were made in the newly opened West Cote Blanche field, St. Mary Parish, by Texas Co. The locations are Nos. 2 and 3 State, and the drilling barge is being moved to No. 2 State. The discovery well was completed the previous week for a small producer at 3,109-36 ft.

Production from a new horizon was opened in the Paradis field with the completion of Texas Co.'s No. 3 L. L. and E. Paradis, which flowed 958 bbl. of oil per day through a ¼-in. choke from perforated casing at 10,187-10,212 ft. Drilling was started by the company on No. 4 Paradis in Section 6-14s-20e.

Texas Coast

Along the Texas coast T. A. Carlton and others' No. 1 Bender, a wildcat east of Humble, Harris County, was attracting attention as the well drilled below 7,825 ft., after a drill-stem test in a sand section at 7,798-7,808 ft. tested several pounds of gas pressure and salt water. The sand section was broken and carried a gas and distillate odor. The well topped the Cockfield at 7,385 ft. and the Eponides Yeguaensis at 7,596 ft. Location is in the J. W. Singleton Survey.

Republic Production Co.'s No. 1 Sterne, northwest of the Joes Lake field in the old Spurger gas field, flowed 502 bbl. of pipe-line oil per day through a ¼-in. choke, with tubing pressure 875 lb. This well was originally completed as a gas well several years ago and was deepened to 4,704 ft.

Several interesting outposts were being started in the West Ranch field, Jackson County. On the extreme west side of the field Renwar Oil Co. spudded No. 1 Phillips on a farmout lease from Shell Oil Co. west of the most westerly producer in the field. W. Stewart Boyle has derrick up for No. 1 J. M. Bennett in the R. Musquiz Survey. Wildcat locations announced for the county include J. F. Hutchins and others' No. 1 Wearden in the J. Williams Survey and John O'Neal and others' No. 1 Ward estate in the I.&G.N. Survey, Block 1, Section 11.

In the Anchor field, Brazoria County, Humble Oil & Refining Co. completed No. 1 Galznik & Taylor for a distillate producer. Production was obtained by perforating casing at 10,480-83 ft. and the well flowed 3 bbl. of 52-gravity water-white distillate per hour through a ¼-in. choke. The company continues to test No. 1 Carr and No. 1 Crockett. No. 1 Carr is testing through perforated casing at 10,481-86 ft., while No. 1 Crockett is testing through perforated casing at 9,626-28 ft.

The West Beaumont field, Jefferson County, was expected to be extended about 2,000 ft. northeastward as Stanolind Oil & Gas Co. prepared to test No. 1 Treadway Land Co. The hole is bottomed at 5,380 ft. and 5½-in. casing was cemented at 5,379 ft. preparatory to testing sand at 5,375-80 ft.

Material was being moved in for a new Harris County wildcat in the Highlands area, to be drilled by Martin Thompson on the Highlands Farms Corp. lease in the Jessie White Survey. Contract depth is 6,500 ft. In the Goodrich area, San Jacinto County, Shell Oil Co., Inc., is clearing location for No. 1 Santa Fe Tie & Lumber Co., a projected Wilcox test located in the James Rankins Survey.

In the Lissie area, Wharton County, Strake Petroleum Corp.'s No. 1 Poole, a Wilcox test, is flowing an estimated 10 bbl. of fluid per hour, of which 99 per cent is salt water and the remainder oil. Tubing and casing pressure is 250 lb. The well is testing through perforated casing at 9,927-50 ft.

Location for a deep wildcat was staked in the Alta Loma area, Galveston County, by Stanolind Oil & Gas Co. The well is on the John A. Hullen lease in the Asa Brigham Survey. In the Cypress area, Harris County, John Mayo staked location for No. 1 John Anderson, about 1 mile southwest of Gulf Oil Corp.'s No. 1 H. H. Roberts, which was temporarily abandoned at a total depth of 7,583 ft.

TEXAS GULF COAST COMPLETIONS IN PROVEN FIELDS

Fort Bend County

Thompson field: Gulf Oil Corp.'s No. 7-B Wolters, sand 5,403-25 ft., 128 bbl., ⅛-in. choke. Humble Oil & Refining Co.'s No. 27 Davis, 5,410 ft., 576 bbl., ¼-in. choke.

Harris County

Clear Lake field: Humble Oil & Refining Co.'s No. 35-C West, 5,910 ft., 120 bbl., ⅛-in. choke. Gem Oil Co.'s No. 4 White, sand 6,809-32 ft., 50 bbl., ⅛-in. choke.

Jackson County

Mauritz field: Coastal Drilling Co.'s No. 1 Combs, sand 5,615-44 ft., 60 bbl., ¼-in. choke. West Ranch field: Magnolia Petroleum Co.'s No. 56-A West, perforated casing 5,745-58 ft., 508 bbl., ¼-in. choke. Magnolia Petroleum Co.'s No. 58-A West, perforated casing 5,122-28 ft., 552 bbl., ¼-in. choke.

Jefferson County

Lovells Lake field: Humble Oil & Refining Co.'s No. 14 Broussard, 7,790 ft., 168 bbl., ⅛-in. choke.

Liberty County

Hardin field: Paul Benedum's No. 1 Humphrey, 7,666 ft., dry and abandoned. Esperson field: General Crude Oil Co.'s No. 11-B Esperson, perforated casing 6,955-7,013 ft., 103 bbl., ¼-in. choke.

Polk County

Segno field: Gulf Oil Corp.'s No. 31 Wing, 8,090 ft., 508 bbl., ¼-in. choke. Humble Oil & Refining Co.'s No. 21 Kirby Lumber Co., 8,460 ft., 480 bbl., ¼-in. choke.

Tyler County

Spurger field: Republic Production Co.'s No. 34 fee, perforated casing 7,667-90 ft., 410 bbl., ¼-in. choke.

Wharton County

Withers field: Texas Co.'s No. 18-A Thompson, sand 5,538-43 ft., 92 bbl., ⅛-in. choke. McDannald Oil Co.'s No. 1 Franz, sand 5,536-47 ft., 138 bbl., ⅛-in. choke.

Eastern Kentucky

(Continued from Page 101)

completed report shows it making 486,000 cu. ft. of gas after blowing open for 2 days.

Ray Davis and others were drilling at 1,141 ft., in black shale, in No. 1 Cleil Gilley, 2 miles southwest of Ezel.

In Mason County W. S. & T. Co. (a Michigan concern) is down 1,470 ft. on the Weaver farm, 8 miles east of Maysville. The firm expects to reach St. Peter sand within the next few hundred feet, the report says.

In Wolfe County Jim Hollon is drilling at 3,800 ft. in No. 2 D. H. Rose. St. Peter horizon in No. 1 Rose was topped at 3,500 ft.

In Knott County Inland Gas Corp. is down 2,281 ft. in No. 212 W. R. Smith and others, on Perkins Branch, with drilling continuing in Big lime.

The Kentucky-West Virginia Gas Co. is drilling three wells in the county and six more in Martin and Floyd counties.

Rocky Mountain Area

By T. R. INGRAM

Public-Domain Leases Failed To Attract a Single Operator

DENVER, Colo., Apr. 8.—The Department of the Interior's first offering of leases on the public domain following the cancellation of prospecting permits failed to arouse any interest in the Rocky Mountain area and no applications were filed at Denver for leases on 48 prospecting permits.

The Mountain Fuel Supply Co. has released a location for a well on the Hiawatha structure, Moffat County, Colorado, which is expected to go a long way toward determining the oil possibilities in the old gas field.

The only completions were two in Cut Bank and two in Osage. In Cut Bank the British American Oil Co.'s No. 12 Tribal swabbed 135 bbl. and the Santa Rita Oil & Gas Co.'s No. 4 Stahl swabbed 85 bbl. before being shot. In Osage a 2-bbl. pumper and a dry hole were completed in the shallow shale.

New operations included one in the Rangely field in Colorado, one in the Hiawatha field, a joint test by the Vickers Petroleum Co. and the Continental Oil Co. in Crook County, Wyoming, one in Lance Creek, two in Osage, one in Cut Bank, and three in Kevin-Sunburst.

NEW MEXICO

Completion of a long-testing wildcat, ½ mile west of the Carter area in Lea County, together with the indicated completion of a good producer in the High Lonesome field of Eddy, held the attention during the week in the Southeast New Mexico district.

Culbertson & Irwin, Inc.'s No. 1 T. M. Lankford, NE NW Section 25-23-36, ½ mile west of the Carter area in Lea County, recorded its official completion during the week. The well made an average flow of 35 bbl. per day through open 2-in. tubing set at 3,570 ft. Pay was topped at 3,490 ft., total depth 3,618 ft. The main pay section from 3,540 to 3,600 ft. was shot with 120 qt.

Indicating a new producer for the High Lonesome field in extreme northern Eddy County, Sikes and others' No. 1 Abbie Iles, SE SW Section 20-16-29, filled 450 ft. with oil after drilling 24 ft. into sand topped at 1,776 ft., total depth 1,800 ft. The well is shut down for the erection of storage.

Another test in the High Lonesome field nearing the pay is Waddell Drilling Co.'s No. 1 Iles, Section 17-16-29. It was last reported drilling below 1,753 ft.

A closely watched wildcat in Lea County is Sam Weiner and Lou Stogner's No. 1 State, SE SE Section 30-12-32. It encountered water in sand and gravel at 328 to 332 ft. and is underreaming 12½-in. casing to the total depth of 472 ft.

Chaves County was reported to have been given a new wildcat test by H. J. Steinberger of Artesia. The test is No. 1 Headley, located in the NW SW Section 26-14-29. Contract depth is reported to be 3,700 ft. and it will be drilled by Silas Pitman with cable tools. It is scheduled for spudding April 15.

Crude Purchases Cut

Vigorous protest has been filed by producers in New Mexico against the recently announced 15 per cent reduction in crude-oil purchases by Sinclair Prairie Oil Marketing Co. Operators pointed out that unless Sinclair Prairie rescinds the order other purchasers will announce similar cuts in order to maintain proportional purchases between the companies buying the district's crude. The cut was announced some time ago by the company and became effective March 29. It amounted to 2,800 bbl., or from 18,750 bbl. daily to 15,950 bbl. daily.

SOUTHEAST NEW MEXICO COMPLETIONS

Lea County

In the Halfway field, Argo Oil Corp.'s No. 2 State, SW NW Section 16-20-32, pumped 200 bbl. daily from pay from 2,679 to 2,682 ft. after 1,000 gal. acid.

In the Vacuum field, Standard Oil Co. of Texas' No. 4-3-32 State, SE NW Section 32-17-35, flowed 15 bbl. hourly for 24 hours through open 2-in. tubing from pay from 4,325 to 4,620 ft. after 500 gal. acid. Magnolia Petroleum Co.'s No. 58 State-Bridges, SW SW Section 24-17-34, flowed 60 bbl. in 5 hours through open 2-in. tubing from pay from 4,478 to 4,600 ft. after 380-qt. shot. Drilling & Exploration Co.'s No. 4-M State, NE SE Section 29-17-35, flowed 180 bbl. daily through open 2-in. tubing from pay from 4,420 to 4,580 ft., natural flow.

In the Carter area, Culbertson & Irwin, Inc.'s No. 1 Lankford, NE NW Section 25-23-36, flowed 35 bbl. daily from pay from 3,490 to 3,618 ft. after 120-qt. shot.

NORTHWEST NEW MEXICO

San Juan County

Continental Oil Co.'s No. 100 Rattlesnake, SE NW NE Sec. 2-29n-19w. T.D. 7,407 ft.; swbg. and flwg.

COLORADO

Adams County

Derby Dome O. & G. Co.'s No. 2 Baxter, C SE SW Sec. 2-3s-66w, T.D. 2,020 ft.; rep. equip. to res.

El Paso County

F. F. Hintze et al's No. 1 State, CEL SE SE Sec. 16-11s-60w. T.D. 1,025 ft.; U.R. 8¼-in.

Huerfano County

I. E. Sideman-White et al's No. 1 Martinez, C SW NE Sec. 33-26n-67w. Drlg. below 1,000 ft. in Pierre sh; cd. form. and found beds perfectly flat; core showed marine (shell) deposits in it, indicating area is over old ocean bed thrown up on structure and well checking high.

Jackson County

W. N. W. Corp.'s No. 1 North Park Coal, NW NW Sec. 18-9n-78w. Drlg. 4,350 ft.; carrying 8¼-in. below 3,000 ft. show carbon dioxide gas.

Logan County

West Plains Oil Co.'s (formerly West Plains Dev. Co.) No. 1 Sheldon, SE NW SW Sec. 3-10n-55w. Drlg. below 1,000 ft.

Moffat County

The Mountain Fuel Supply Co.'s No. 5 Wilson, SW SW NW Section 23-12n-100, Hiawatha dome, is a location. It is an offset to the same company's No. 1 Kuykendall, which showed for an oil well upon drilling deeper in 1938 and indicated that the field which originally produced gas only, will become an important oil producer.

Mountain Fuel Supply Co.'s No. 5 Wilson, SW SW NW Sec. 23-12n-100w. Loc.; (first report).

Park County

South Park Oil Co.'s No. 1 Leman, NE NE SE Sec. 34-11s-75w. Drlg. 7,202 ft.

Rio Blanco County

The W. L. W. Royalty Corp., composed of Grand Junction people, has made a location in Section 34 in the Rangely field to seek shale oil in fractured zones on the southeastern side of the pool at around 1,000 ft.

W. L. W. Royalty Corp.'s No. 1 Rector, SE Sec. 34-2n-102w. Loc.; (first report).

Texas Co.-California Co.'s No. 3 Unit, NE NE NE Sec. 27-3n-94w. Drlg. below 765 ft.

Washington County

Thurman Oil Tr.'s No. 1 Ruby, NW NW SW Sec. 3-5s-52w. S.D. 1,800 ft. in sd.; will run csg., unload and test S.O.

WYOMING

Big Horn County

Frank S. Scott's No. 1 Robertson, SE SE SE Sec. 6-54n-93w. S.D. 650 ft.; indef.

Yale Oil Corp.'s No. 1 Simonson, Lot 53, Sec. 34-55n-97w. T.D. 4,412 ft.; cmtd. 7-in. at 4,029 ft.; acd. with 1,000 gal.; R.U. pmpg. equip.

Crook County

A test on the Government Canon structure in Crook County, in the northeastern corner of Wyoming, will be drilled by the Vickers Petroleum Co. and the Continental Oil Co. The Vickers company will be the operator. It will be drilled with cable tools and probably will test all horizons down to the granite. The first of these will be the Sundance at a depth of a few hundred feet and others will be the horizons in the Minnelusa formation which are productive in Lance Creek and the Madison lime. Tentative location is in the NW NE SW Section 28-57n-64w.

Natrona County

The General Petroleum Corp.'s No. 1-21-G, on Cole Creek, ½ mile northwest of the discovery, drilled through the Lakota sand, the producing horizon in the discovery, to 8,050 ft., total depth, and is swabbing down to test after cementing the 7-in. on top at 8,002 ft. The cores showed saturation.

General Pet. Corp.'s No. 1-21-G, NW NW NW Sec. 21-35n-77w. T.D. 8,050 ft.; prep. to test.

Niobrara County

Lance Creek had no completions and only one new operation, an inside well on the west side. Several wells are, however, in the final stages of completion.

Minnelusa Oil Corp.-MacKinnie O. & D. Co's No. 10 Thompson, NW NW NW Sec. 7-35n-65w. Cmtd. 12½-in. at 322 ft.; W.O.C.; (first report).

Ohio Oil Co.'s No. 14 E. Lamb-Acct. 2, C SW SE Sec. 5-35n-65w. Rig; W.O. rotary.

Continental Oil Co.'s No. 3 E. Rohlff, SE SW NW Sec. 32-36n-65w. T.D. 837 ft.; cmtd. 10¾-in. at 303 ft.

Ohio Oil Co.'s No. 8 State-Lamb, NW NW NW Sec. 36-36n-65w. Drlg. 4,240 ft.; T. upper Sundance 4,140 ft.

MacKinnie O. & D. Co.-Minnelusa Oil Corp.'s No. 9 Thompson, NW SE NW Sec. 7-35n-65w. Drlg. 2,920 ft.; cmtd. 13-in. at 316 ft.

Continental Oil Co.'s No. 18 Tom Bell, SE NE NE Sec. 33-36n-65w. Drlg. 5,210 ft.; red marker at 5,167 ft.

Continental Oil Co.'s No. 7-B Dielman, SE SE NE Sec. 7-35n-65w. Rig; W.O. equip.

Ohio Oil Co.'s No. 16 Putnam, SW SW NW Sec. 4-35n-65w. Rig; W.O. equip.

Continental Oil Co.'s No. 6-B Dielman, NE SW NW Sec. 8-35n-65w. Drlg. 5,221 ft.

Minnelusa Oil Corp.'s No. 1 Joss, NE SE NW Sec. 6-35n-65w. T.D. 5,443 ft. in Joss sd.; cmtd. 5½-in. at 5,213 ft.; swbg. down to test.

Ohio Oil Co.'s No. 14 Carrie Putnam, NW SW SW Sec. 33-36n-65w. T.D. 5,407 ft.; cmtd. 7-in. at 5,307 ft.; cd. sat. in Joss sd.; tstg.

Ohio Oil Co.'s No. 15 Carrie Putnam, NW NE SW Sec. 33-36n-65w. Drlg. 2,880 ft.; cmtd. 13-in. at 301 ft.

Continental Oil Co.'s No. 10-B Schuricht, SE SE SE Sec. 6-35n-65w. T.D. 5,230 ft.; sat. core in Leo sd. at 5,215-30 ft.; cmtd. 7-in. at 5,211 ft.; W.O.C.

H. D. Moore's No. 1 Berggren, SE NW Sec. 23-35n-63w. T.D. 2,526 ft.; rng. 4½-in. for W.S.O.

Ohio Oil Co.'s No. 8 Converse Sheep, NW SE SW Sec. 32-36n-65w. T.D. 5,182 ft.; fsg.; sat. cores at 5,088-5,112 ft. and 5,140-56 ft.

Park County

Minnelusa Oil Corp.'s No. 1 Roney, SW SW NW Sec. 24-58n-98w. Rng. rig foundation.

Sublette County

Marvel Oil Co.'s No. 1-G Govt., NE NE SE Sec. 28-27n-113w. T.D. 1,040 ft.; R.U. to D.D.; comp. in Jan. for 8 B.P.D.

Marvel Oil Co.'s No. 1-H Govt., CEL NE SE Sec. 28-27n-113w. S.D. after R.U.

Sweetwater County

Sinclair-Wyoming Oil Co.'s No. 92-A, NE NW SW Sec. 11-26n-90w. T.D. 2,091 ft. in T. Sundance; prep. to run 7-in.

Sinclair-Wyoming Oil Co.'s No. 91-A, SE NE NE Sec. 10-26n-90w. T.D. 2,080 ft.; swbd. 175 bbl. in 8 hrs.; tstg.

Vermilion Oil Co.'s No. 2 Govt., SW SW SW Sec. 7-12n-99w. Drlg. 2,539 ft.

Washakie County

Paul Boether's No. 1 Govt., SW SW NW Sec. 4-47n-90w. T.D. 2,160 ft. in Thermop. sh.; 7-in. at 2,090 ft.

Weston County

Osage had two completions. Butcher Brothers' No. 5, SW NW NE Section 16-46n-63w, was dry at 258 ft., and the Wheedon Oil Co.'s No. 18, SW SE SE Section 16-46n-63w, pumped 2 bbl. per day at 225 ft.

Geo. Keisling's No. 2 Lundberg, CWL NE SE Sec. 35-46n-64w. Rdy to spd.; (first report).

Riggs Oil Co.'s No. 4, CNL NE SE Sec. 16-46n-64w. Loc.; will go to Sundance with C.T.; (first report).

Patterson Oil Co.'s No. 21 fee, NW SW SE Sec. 17-46n-63w. T.D. 670 ft.; cmtd. csg. on T. sd.

Wheedon Oil Co.'s No. 5 State, NW SW SE Sec. 16-46n-63w. Drlg. 182 ft.
Gose Oil Synd.'s No. 1, NE NE NE Sec. 28-47n-63w. Drlg. 4,963 ft.
Bruce C. Teeter's No. 1 State, C SW NE Sec. 36-32n-6w. S.D. 2,270 ft.; may go to Bell sd.

MONTANA

Blaine County

F. J. Buscher's No. 1 Evey, C NE SE Sec. 12-32n-17e. S.D. 61 ft.

Glacier County

Cut Bank had two completions and one new operation. The British American Oil Co.'s No. 12 Tribal, C SE NW Section 34-35n-6w, swabbed 135 bbl. the first 24 hours at 2,910 ft., total depth, from the Cut Bank sand at 2,855-2,908 ft. The main pay was at 2,887-2,908 ft.

The Santa Rita Oil & Gas Co.'s No. 4 Stahl, CSL NW SE Section 20-33n-5w, swabbed 85 bbl. the first 24 hours at 3,010 ft., total depth, from the Cut Bank at 2,945-78 ft. It was then shot with 60 qt. at 2,970-82 ft.

Santa Rita O. & G. Co.'s No. 4-A Govt., C SE NE Sec. 8-32n-5w. M.I.M.; (first report).
Glacier Prod. Co.'s No. 5 Miller, C SW NE Sec. 32-33n-5w. Spdg.
Glacier Prod. Co.'s No. 4 Bonnett, C SW SE Sec. 4-32n-5w. Drlg. 1,445 ft.
Glacier Prod. Co.'s No. 4 Van Ormer, C SW SE Sec. 8-33n-5w. Drlg. 1,840 ft.
Texas Co.'s No. 4 Tweedy, C SE NW Sec. 21-35n-6w. Drlg. 520 ft.
Texas Co.'s No. 1 Unit 11, C NE SW Sec. 11-35n-6w. Drlg. 1,955 ft.
Annand Hutchings' No. 4 Federal Land Bnk., 2,310 ft. W, 2,310 ft. S lines, Sec. 11-34n-6w. Drlg. 2,300 ft.
Santa Rita O. & G. Co.'s No. 10 Tribal, NW NW NW Sec. 15-35n-6w. Cmtd. 7-in. at 2,850 ft.; W.O.C.; good S.O. at 2,850-53 ft.
A. B. Cobb's No. 5 Van Demark, CSL SE NE Sec. 35-35n-6w. Loc.
A. B. Cobb's No. 5 Walberger, CNL NE SE Sec. 35-35n-6w. Cmtd. 7-in. at 2,755 ft.; W.O.C.
R. C. Tarrant's No. 5 State, NW NE SE Sec. 36-34-6w. Drlg. 2,770 ft.
Helmac, Tr.'s No. 3 Govt., Lot 3, Sec. 32-33n-5w. R.O.G.
Cobb-Reagan's No. 4 Jackson, SW SW SE Sec. 5-32n-6w. R.U.R.

Petroleum County

H. Clark Rowland's No. 1 Brundige-Mink, NE SE NW Sec. 35-14n-25e. T.D. 722 ft.; 8⅝-in. on bttm.; prep. to res.

Toole County

Coolidge & Coolidge's No. 9 Shaw, SE NE NE Sec. 35-38n-2w. Drlg. 510 ft.; (first report).
Coolidge & Coolidge's No. 8 Shaw, NW NE NE Sec. 35-38n-2w. Spd. to 100 ft. and S.D.; (first report).
Rimrock Oil Co.'s No. 5 Schmidt, SW SE NW Sec. 29-35n-3w. Spdg. 320 ft.; (first report).
M. F. Telee's No. 1 Blumberg, NE cor. Sec. 32-35n-3w. Drlg. 395 ft.
S. V. Day's No. 1 Halter, C NE SE Sec. 17-35n-2w. S.D. 140 ft.
Fulton Pet. Co.'s No. 4 Thompson, CNL SW NE Sec. 28-35n-3w. Drlg. 300 ft.
G. & A. Oil Co.'s No. 2 Alrick, C NW NE Sec. 28-35n-3w. Drlg. 840 ft.
Big West Oil Co.'s No. 1 Ellingson, NW SE SW Sec. 14-35n-3w. Loc.
Prevol & Shay's No. 6 Govt., NE NW SW Sec. 11-35n-3w. R.O.G.
Crumley & Son's No. 18 Fryberger, CEL SE SW Sec. 24-35n-3w. R.U.
A. Beardslee's No. 13 Swears, CEL SE NW Sec. 9-35n-2w. Drlg. 910 ft.
G. H. Lund's No. 1 Dahlen, C SE NW Sec. 35-35n-4w. T.D. 2,063 ft.; more wtr.; trying to S.O.
R. G. Parrant's No. 1 Holbrook, C NW NE Sec. 2-36n-3w. S.D. 1,445 ft.
Prevol & Shay's No. 5 Govt., SE NW SW Sec. 11-35n-3w. T.D. 1,845 ft.; contact 1,792 ft.; small S.O. 1,812 ft.; wtr. at 1,842 ft.; P.B. to 1,815 ft. and shot; C.O.
Casper T. Olen's No. 9 Engemoen, NW NE NW Sec. 14-35n-2w. S.D. 70 ft.
L. J. Yealy's No. 14 Shaw, NW SW NE Sec. 35-36n-2w. R.O.G.
Superior Pet. Co.'s No. 3 Haugen, C NE NE Sec. 11-35n-3w. T.D. 1,722 ft.; cmtd. 5⅛-in. at 1,712 ft.
Lemac Oil Co.'s No. 1, C NE NE Sec. 27-36n-2w. T.D. 1,906 ft.; contact 1,900-06 ft.; good S.O. in sdy. L.; S.D.
Morton & Shaw's No. 2 Ellingson, SE NE NW Sec. 23-35n-3w. S.D. 1,200 ft.

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West Texas Fields

(Continued from Page 103)

county. The test will be No. 1 B. C. Humphrey, C SE SW Section 192, B.B.B.&C. Survey.

Possibility of opening a new producing area in Jones County was seen when T. D. Humphrey's No. 1 W. V. Triplett, 990 ft. from the east and 330 ft. from the south lines of the Triplett tract in the J. J. Hughes Survey, Abstract 201, found sand at 2,185 ft. which responded with several flows of oil by heads. Operator is preparing to cement casing for a test of the section which has been called the Cook sand, saturation having been drilled from 2,185-95 ft.

Coleman County

The Novice field in Coleman County drew considerable attention during the week as both east and south outposts indicated production from the field's Gardner sand horizon. Bradford & Robertson's No. 1 Morris estate, east of the States Oil Corp.'s No. 1 Morris, a 700-bbl. producer, is awaiting gage after assuring production in the Gardner sand, Strawn series, after a 20-qt. shot. The well is in Section 176, Block 2, G.H.&H. Survey, and is reported making considerable gas.

South of the production limit of the field Joe Worsham's No. 1 C. C. Williams, Section 18, Block 2, T.&N.O. Survey, drilled 35 ft. of Gardner sand which showed some oil. Operater was preparing to test as the week closed.

WEST CENTRAL TEXAS COMPLETIONS

Callahan County

In the Putnam field W. D. Austin's No. 1 Yarbrough, 295-303 ft., 4 bbl. O. Stutenroth's No. 1 Slaughter, dry and abandoned at total depth 471 ft. Trumpter Oil Co.'s No. 1 Slaughter, 377-80 ft., 51 bbl. Trumpter Oil Co.'s No. 2 Slaughter, 377-79 ft., 43 bbl. Trumpter Oil Co.'s No. 3 Slaughter, 385-91 ft., 19 bbl. Valley Osage's No. 7 Slaughter, dry and abandoned at 358 ft.

In the Baird field J. R. Hart's No. 3 George, dry and abandoned at 761 ft.

Comanche County

In the Amity field St. John & Choate's No. 1 Henry, 621-37 ft., 15 bbl.

Jones County

A wildcat, Merry Brothers & Perini's No. 1 Hodges, A. Bell Survey 6, dry and abandoned at total depth of 2,104 ft.

In the Lewis field Sandy Ridge Oil Corp.'s No. 3 Alton, 1,900-10 ft., 271 bbl.

Palo Pinto County

In the Strawn field Palo Pinto Oil & Gas Co.'s No. 18-B Strawn Coal Co., 3,012-20 ft., 2,800,000 ft. gas.

Shackelford County

In the Huskey field A. P. Schkade's No. 1 Godwin, dry and abandoned at 881 ft.

In the Albany field Bowne's No. 1 Simpson, dry and abandoned at 653 ft.

In the Jackson field Thomas Wittmer estate's No. 1 Jackson, dry and abandoned at 936 ft.

Stephens County

In the Stroud field Shaw's No. 2 Stroud, 2,584-87 ft., 15 bbl.; Shaw's No. 3 Stroud, 2,586-91 ft., 65 bbl.

In the Stribling field, Clyde Greathouse's No. 1 Robertson, 3,551-72 ft., 249 bbl. in 2 hours or at the rate of about 3,000 bbl. daily.

TEXAS PANHANDLE COMPLETIONS

(24-hour gages)

Gray County

Magnolia Petroleum Co.'s No. 30 fee No. 277, 2,895-2,976 ft., 189 bbl. Skelly Oil Co.'s No. 106 Schafer, 3,205-85 ft., 437 bbl. Cities Service Oil Co.'s No. 6-C Meers, 3,167-3,225 ft., 148 bbl. Gulf Oil Corp.'s No. 11 Saunders, 3,025-95 ft., 243 bbl. Ryan Consolidated Oil Co.'s No. 4 Barrett, 3,195-3,245 ft., 32 bbl. King Oil Co.'s No. 5 Donkin, 3,245-95 ft., 376 bbl.

Hutchinson County

Gulf Oil Corp.'s No. 95 Dial, 2,985-3,029 ft., 210 bbl. Danube Oil Co.'s No. 2 Alaska, 2,895-2,956 ft., 21 bbl. Phillips Petroleum Co.'s No. 10 Haile, 2,995-3,045 ft., 415 bbl. Texas Co.'s No. 22 Pond, 2,885-2,965 ft., 875 bbl. Texas Co.'s No. 20 Lewis, 2,950-3,035 ft., 604 bbl. Huber Petroleum Corp.'s No. 7 Weatherly, 3,025-95 ft., 1,472 bbl. Texoma Natural Gas Co.'s No. 22-P Sneed, gaged 10,834,000 cu. ft. gas from granite-wash formation.

Illinois Fields

(Continued from Page 100)

In Clinton County H. J. Brown and others were rigging up rotary for No. 1 unnamed farm, C NE NE Section 32-3n-4w.

In Clay County Jarvis Brothers and others' No. 1 Hazel estate, NE NE NW Section 22-2n-9e, was drilling below 700 ft.

In Wabash County Clark B. Hill's No. 1 Woods, NE SE SE Section 21-2n-14w, moving in rotary tools.

In White County Guthrie and others had rig up for No. 1 Ott Cox, SE NW SE Section 5-4s-14w.

Wildcat Progress

In Iroquois County Whitlow's No. 1 Gannon, NW cor. SW SE Section 5-27n-12w, was drilling at 402 ft.

In De Witt County Waharp Oil & Gas Co.'s No. 1 Short, NE cor. SW Section 6-20-3e, drilling below 135 ft.

In Bureau County Kerchner's No. 1 Gulther, NE cor. SE SW SE Section 2-12n-8e, of fourth principal meridian, drilling at 705 ft.

In Cass County Cass Community Oil Co.'s No. 1 Maslin, NW SE SE Section 2-17n-10w, Devonian lime top at 935 ft., small showing of oil at 935-40 ft. and 955-60 ft., drilling at 1,015 ft. after setting 4-in. casing at 1,010 ft.

In Macon County Jarvis' No. 1 Veeck, SE SE NE Section 11-16n-3e, total depth 2,315 ft., was shut down for orders.

In Coles County East Oakland Syndicate's No. 1 Temple, SW cor. NE Section 36-14n-10e, total depth 2,290 ft., cleaning out. Carter Oil Co.'s No. 1 Seaman, NW NE SW Section 35-12n-7e, St. Peter sand at 4,689 ft., odor of oil at 4,689-91 ft., cored at 4,691-95 ft., recovered 4 ft. of hard sand, with spotted pin-point showings of oil; drilling at 4,745 ft. in a very hard formation.

In Shelby County Walker's No. 1 Odell, C E½ SE NW Section 20-14n-2e, reaming at 1,620 ft.; will rerun 4-in. casing. Baugher's No. 1 Anderson, NW cor. Section 36-12n-5e, total depth 1,500 ft., waiting for casing.

In Clark County Snavely's No. 1 Scolfield, SE NE SE Section 6-11n-11w, Ste. Genevieve lime top 1,031 ft., drilling at 1,983 ft. Allen & Sherrett's No. 1 Biggs, NW NW SW Section 9-11n-14w, drilling at 2,225 ft.

In Montgomery County A. W. Burroughs' No. 1 Eaglehoff, SW SW SW Section 29-10n-4w, total depth 649 ft., cleaning out. Jack Brown's No. 1 Lipe, SW SW SE Section 28-10n-3w, drilling below 890 ft.

In Crawford County La Salle Drilling Co.'s No. 1 Berryhill, NE NE NW Section 9-6n-13w, total depth 2,976½ ft., and dry; plugged back to 1,903 ft. and will perforate casing and test. Dorning & Lesser's No. 1 Ducomon, C N½ NW NW Section 31-6n-12w, rig up.

In Fayette County Steele and others' No. 1 Black, SE NE SW Section 25-6n-2e, total depth 1,604 ft., plugged back to 1,601 ft., pumped 100 bbl. of oil and 5 bbl. of water in 14 hours; still testing.

In Bond County Central States and others' No. 1 Rich, NE NE SW Section 28-6n-4w, drilling at 1,720 ft.

In Madison County Wilson's No. 1 Danderman, SW SW SW Section 1-5n-6w, drilling below 1,275 ft. R. J. Jennings and others' No. 1 Mossiman, SE SW NW Section 22-4n-5w, drilling at 1,450 ft.

In Lawrence County Whisenant and others' No. 1 Wagner, NE cor. Section 20-4n-13w, drilling at 2,410 ft. Paint Creek sand was topped at 2,280 ft.

In Schuyler County H. Miller's No. 1 Feldheimer, SW cor. SE NW Section 12-3n-3w of fourth principal meridian, shut down at 648 ft. awaiting orders.

In White County W. F. Fortner's No. 1 G. P. Colvin, NE NE SW Section 9-4s-14w, total depth 2,723 ft., set 5 3/16-in. casing at 2,706 ft., and after plug was drilled well flowed 75 bbl. in 4 hours. After it had flowed 210 bbl. it was shut in until tanks are provided. Phillips Petroleum Co.'s No. 1 Goss, C W½ NW NW Section 31-4s-11e, was drilling at 4,375 ft. C. D. Neff and others set 10-in. casing at 119 ft. in No. 1 Buss heirs, NE NE NE Section 28-5s-8e.

In Massac County Marshall Drilling Co.'s No. 1 McGhee, NE NE NE Section 3-16s-5e, topped Devonian lime at 2,130 ft. and was shut down for orders at 2,285 ft.

In Hamilton County Kingwood Oil Co.'s No. 1 Dodd, SE SE NW Section 6-6s-7e, was drilling at 2,390 ft.

In Clinton County Trumbell's No. 1 Dillman estate, NE SE NE Section 12-2n-5w, fishing at 550 ft.

In Monroe County Hughes Petroleum Co.'s No. 1 Meyer, NE SW SE Section 28-2s-10w, drilling at 1,200 ft. Silurian was topped at 685 ft. and top of Ordovician lime lay at 745 ft. and Kimmswick at 855 ft.

In Jefferson County Chicago Syndicate's No. 1 Hanke, NE SE NE Section 3-2s-1w, Glen Dean topped at 1,182 ft., coring at 1,527 ft.

In Edwards County Jarvis Brothers and others' No. 1 Wick, NE SE NE Section 24-2s-10e, on a 25-minute test at 2,370-87 ft., recovered 910 ft. of oil and 85 ft. of oil-cut mud; set 5-in. casing at 2,375 ft. Superior Oil Co.'s No. 1 Woods, NE SW NW Section 19-2s-11e, drilling at 2,550 ft.; a drill-stem test at 2,378-98 ft. recovered 13 ft. of sand with good porosity and saturation, and 4 ft. of sand spotted with oil and 1 ft. of gray sand.

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Second of a series, "How Pease Blue Printing Equipment is Serving the Oil and Gas Industry"

North Louisiana, Arkansas

By
GEORGE WEBER

La Salle Parish's Discovery Well Causes Increased Work

SHREVEPORT, La., Apr. 8.—Increased drilling activity in the Olla district, newly opened La Salle Parish field in North Louisiana, featured the week's activity in the tristate area. The Wilcox discovery is being followed by drilling to the north, east, and southeast, with results forthcoming shortly in the shallow section. Interest in North Louisiana will turn in the next few weeks to the Haynesville area, where one deep Glen Rose test is already under way 2 miles southwest of the field, and where a deeper test will begin soon.

South Arkansas interest still centers around Fouke, where the Standard Oil Co. of Louisiana's No. 1 Sturgis is drilling and coring the lower Glen Rose formation, after encountering oil shows in three horizons. Another failure in the Smackover lime was Forgotson's No. 1 Dendy, south of Village in Columbia County. The current Smackover lime wildcat of interest is Atlantic Refining Co.'s No. 1 Bodcaw Lumber Co., in Lafayette County.

Olla Activity

Following the completion of Placid Oil Co.'s No. 9 Louisiana Central Lumber Co., east of Urania in La Salle Parish, North Louisiana, the two major acreage holders in the section, Arkansas Fuel Oil Co. and H. L. Hunt, are beginning outpost exploratory tests. Placid Oil Co.'s (Hunt) Nos. 10 and 11 Louisiana Central, 1 mile north and 6 miles east, respectively of the field discovery, are already under way, with the former due to hit the Wilcox formation at any time.

Arkansas Fuel Oil Co. is going back into an abandoned wildcat, No. 1 Louisiana Central, Section 31-12-3e, about 9 miles due north of the Placid well, in Caldwell Parish. In the old hole, bottomed at 7,528 ft., operators are taking sidewall cores in the Wilcox formation above 3,600 ft. The Wilcox is producing in the Placid well about 640 ft. below the top of the formation, differing from all other Wilcox production which is generally found near the top.

To the southeast of the well, about 1 mile, E. F. Neely has staked No. 1 Lizendy, in the NE cor. Section 19-10-3. These tests, for the most part located a distance from the well, will be watched with interest to determine the extent of the Wilcox production in the Olla district.

Fouke District

Starting an active leasing campaign extending through Miller and Lafayette counties, Arkansas, and extending southwest into Cass County, Texas, Standard Oil Co. of Louisiana's No. 1 Sturgis continues to make hole, exploring the deeper possibilities. The test first got attention when it tested oil in the Blossom sand, and later when it showed commercial oil in the Paluxy at 3,584-3,600 ft. and has continued in the spotlight as it cored the lower formations. Last week operators cored from 6,035-55 ft., recovering 18 ft., of which 14 ft. was fine tight sand with a show of oil in the top and 3 or 4 ft. of red shale. Coring continues below 6,485 ft. over the weekend.

Operators may drill the test to the Smackover lime, and if no greater production is found, they will plug back to the Paluxy to complete as a field discovery. The wildcat is 12 miles southeast of Texarkana, and near the Garland City field, Miller County.

A Smackover lime wildcat in Columbia County, James Forgotson's No. 1 L. M. Dendy, C SW SW Section 24-17-19, southeast of Village, failed to show production last week. Cotton Valley lime was topped at 5,374 ft., Buckner formation at 7,497 ft., Smackover lime at 7,568 ft., and the oolitic Reynolds member at 7,580 ft., with porosity beginning at 7,583 ft. Soft porous oolitic lime was cored at 7,587-7,606 ft., and a drill-stem test was taken at 7,589-7,606 ft., using ⅝-in. chokes. The formation tested 26 thribbles of sulfur water, and the test may be abandoned at 7,768 ft. This marks the fifth Smackover wildcat failure in Columbia County. Six wildcats successfully opened fields.

EAST TEXAS BORDER COMPLETIONS

Smithland—Marion County

L. Lindsay's No. 1 B. and C. Griffith heirs, G. Coore Survey, pumping 80 bbl., total depth 2,230 ft. L. Lindsay's No. 2 Hart, pumping 110 bbl., total depth 2,335 ft.

Production by Pool

Estimated daily gross production, all companies, week ended April 5:

NORTH LOUISIANA

	Bbl.
Bellevue	470
Caddo, light	5,220
Caddo, heavy	2,170
Converse	500
Cotton Valley	*14,520
Cross Lake	4,745
De Soto and Red River	955
Elm Grove	305
Haynesville	2,745
Holly	65
Homer	2,730
Lisbon	5,280
Olla	210
Pleasant Hill	95
Rodessa	20,830
Sarepta-Carterville	†335
Sligo	1,825
Sugar Creek	695
Urania	2,425
Zwolle	1,890
Total North Louisiana	68,010

SOUTH ARKANSAS

Atlanta	1,090
Big Creek	closed in
Buckner	1,800
Champagnolle	1,145
Dorcheat	1,410
El Dorado	1,660
Lewisville	700
Lisbon	220
Magnolia	19,800
Miller County	270
Nevada	540
Nick Springs	115
Rodessa	2,500
Schuler	18,450
Smackover, light	1,705
Smackover, heavy	13,855
Stephens	520
Troy	1,275
Urbana	920
Village	1,275
Total South Arkansas	69,250

*4,195 bbl. is distillate. †100 bbl. is distillate. Texas side of Rodessa 23,580 bbl.

NORTH LOUISIANA COMPLETIONS

Caddo—Caddo Parish

L. M. Calhoun's No. 1 Crawford, Section 32-21-15, pumping 40 bbl., total depth 1,592 ft. Hugh Carney's No. 2 Burton, Section 1-20-16, flowing 50 bbl., open tubing, total depth 1,515 ft. S. S. Hoyman's No. 1 Lane, Section 1-20-16, pumping 50 bbl., total depth 1,498 ft. Stanolind Oil & Gas Co.'s No. 2 Alexander, Section 21-21-15, total depth 1,750 ft., dry and abandoned. Stanolind Oil & Gas Co.'s No. 4 Noel, Section 24-21-15, pumping 10 bbl., total depth 1,636 ft. H. J. Strief's No. 4 Noel estate, Section 12-20-16, flowing 80 bbl., total depth 1,545 ft. L. L. Sugar's No. 3 Etchinson, Section 32-21-15, pumping 60 bbl., total depth 1,535 ft. L. L. Sugar's No. 4 Hart, Section 22-21-16, pumping 25 bbl., total depth 1,021 ft. Texas Co.'s No. 21-B Noel, Section 14-21-15, flowing 324 bbl., open tubing, total depth 1,680 ft.

Wildcat—Caldwell Parish

Critchett & Woods' No. 1 Kyles, NE cor. SW NE Section 18-11-3e, total depth 4,975 ft., temporarily abandoned.

Monroe—Morehouse Parish

Southern Carbon Co.'s No. 28 Tensas, Section 10-21-4, 2,000,000-cu. ft. gas well, rock pressure 800 lb., total depth 2,194 ft.

Zwolle—Sabine Parish

J. H. Thames' No. 1 Longbell, C SW NE SE Section 5-8-13, pumping 10 bbl. of oil and much salt water, total depth 1,987 ft. R. Chestnut's No. 1 Walden, C SE NE NE Section 27-10-13, pumping 7 bbl. of oil and some salt water, total depth 2,006 ft.

ARKANSAS COMPLETIONS

Magnolia—Columbia County

Placid Oil Co.'s No. 2 J. W. Booth unit, C NW SW Section 20-17-19, 240 bbl., 16/64-in. choke, tubing pressure 1,200 lb., casing pressure 1,000 lb., total depth 7,595 ft.

Atlanta—Columbia County

Tide Water Associated Oil Co. and Seaboard Oil Corp.'s No. 1 W. Mack, C SW NE Section 16-18-19, 156 bbl., 9/64-in. choke, tubing pressure 1,400 lb., casing pressure 1,800 lb., total depth 8,268 ft.

Wildcat—Craighead County

Tannard, Inc.'s No. 1 R. M. Martin, Section 35-14w-3e, total depth 5,092 ft., dry and abandoned in hard lime.

Wildcat—Lonoke County

Cabot Drilling Club's No. 1 LeMay, 330 ft. SE cor. SE SW Section 26-4n-9w, total depth 20 ft., abandoned, will not drill.

Troy—Nevada County

Berry Asphalt Co.'s No. 9 Groves Land & Timber Co., 330 ft. south and west, C Section 10-14-20, pumping 20 bbl. oil and 5 bbl. salt water, total depth 1,266 ft.

Ohio Fields

(Continued from Page 101)

pumps, estimated at 2 bbl. and 45 bbl., respectively, depths 539 ft. and 498 ft. Curtis & Eaken's No. 2 Eva C. Eaken, Lot 24, Tract 15, found no Berea sand, depth 590 ft.

In Monroe County, Benton Township, Hanlon & Schoy's No. 7 J. R. Amos, Section 23, made 5 bbl. of oil the first day after a shot in the second Cow Run, depth 860 ft. In Franklin Township H. G. Clymer and others' No. 1 Josie Reed, Section 18, is dry in the Berea, depth 1,708 ft.

In Tuscarawas County, Jefferson Township, Brendel Producing Co.'s No. 1 Edward Burk, Lot 13, second quarter, was abandoned at 4,911 ft., Clinton at 4,816-60 ft., Medina at 4,930-41 ft.

In Washington County, Liberty Township, Koon Run Oil & Gas Co.'s No. 5 A. J. King, Section 22, is a small pumper, making 3 bbl. the first day after shot in the Keener at 1,391-96 ft.

Lima Field

In Allen County, Bath Township, Gilbert & Bowser's No. 1 W. B. Stoner, Section 13, had the top of the Trenton at 1,351 ft., and a small showing; now shut down at 1,410 ft.; may deepen.

In Henry County, Harrison Township, Stevens Oil & Gas Co.'s No. 1 Sarah Wells, Section 36, struck the Trenton at 1,684 ft. and drilled 80 ft. in, and was testing an oil showing.

In Seneca County, Liberty Township, Wilbur Swycard's No. 1 Daniel Baker, Section 9, is a small gas well in the Clinton horizon at 430 ft.

In Wyandot County, Tymochtee Township, I. M. Coyle's No. 1 George Jones, Section 30, was abandoned at 1,500 ft., top of Trenton at 1,325 ft.

Oklahoma Operations

By
DAL DALRYMPLE

Two Discoveries in Lincoln County; Extend Coyle Field

A new pool was discovered in northwestern Lincoln County, another discovery in that county was being tested, the Coyle pool was extended ½ mile westward, a gas area was opened in Rogers County, the Marshall County discovery was preparing to test and the state's deepest drilling well in Caddo County was nearing the 11,000-ft. level, to feature field activities in Oklahoma.

Portable Drilling Co.'s No. 1 Teter, NW NW SW Section 24-17-2e, wildcat in northwestern Lincoln County, was estimated good for 500 bbl. of oil and 20,000,000 cu. ft. of gas after perforating casing in Hunton lime at 4,500-10 ft. and was shut in. Tankage was being erected preparatory to testing. Originally started by George Travis and others, it was drilled to 4,770 ft. in Wilcox sand and was dry. Portable recently made a deal to take over the wildcat and test upper horizons.

Summit Drilling Co. and others' No. 1 Cleer, C W½ SE SW Section 6-15-5, discovery well northwest of the Davenport pool, Lincoln County, flowed 635 bbl. of oil and 252 bbl. of water in 24 hours and operators were emptying tanks for further testing. A pipe line was laid to the well by the Shell company. Originally drilled to 4,637 ft. in Wilcox sand, water intruded and it was plugged back to 3,550 ft., shot and acidized. Prue sand was topped at 3,524 ft.

The Coyle pool in Payne County was extended ½ mile westward at Texas Co.'s No. 1 Burroughs, C E½ NE NW Section 11-17-1e. It found Wilcox sand at 4,927-45 ft., total depth, flowed 211 bbl. of oil in 8 hours and was shut in for tankage.

A gas pool was discovered 1 mile south of Talala, Rogers County, at Charles Bentrup's No. 1 Brown, SW cor. Section 34-24-15. Sand was found at 1,060-88 ft. and it gaged 850,000 cu. ft. of gas daily, with 560 lb. rock pressure. The operator has made location for two offsets. Gas is to be used in the Chelsea field for repressuring.

Pure Oil Co.'s No. 1 Quinton Little A, C W½ NE SE Section 28-5s-7e, Marshall County wildcat, was due to resume work early this week after plugging back from 5,640 ft. to 5,220 ft. and cementing casing. Operators plan to test the Tulip Creek zone, which indicated good production on drill-stem tests.

Sinclair Prairie Oil Co. was drilling below 10,800 ft. in lime at No. 1 German, SW NW NW Section 1-6-13w, Caddo County, deepest test being drilled in Oklahoma.

New operations include Indian Territory Illuminating Oil Co. and Foster Petroleum Co.'s No. 1 Hutton, SW SW SW Section 31-2s-18w, northeast of production in the Frederick deep field, Tillman County; Gled Oil Co., Russell Tarr and others' No. 1 Mitchell, NW NW SE Section 19-7-17w, west side of Hobart pool, Kiowa County; and Ahrens Drilling Co.'s No. 1 Williams, NE NE NW Section 13-9-10, Wetumka area, Hughes County.

Wildcat Operations

W. A. Mason and others' No. 1-A Reed, NW NW NE Section 13-9-7, outpost southwest of the Bethel pool, Seminole County, had Senora sand at 2,251 ft., total depth 2,294 ft., and produced 3,600,000 cu. ft. of gas, with a showing of oil and salt water. It had 865 lb. rock pressure.

Helmerich & Payne, Inc., and others' No. 1 McMahon, SW SW SE Section 31-17-1e, wildcat south of Langston in Logan County, had dolomite at 5,258 ft., first Wilcox sand 5,272 ft., second Wilcox sand 5,420 ft., and was bottomed at 5,435 ft., plugged back to 5,268 ft. Casing was perforated in dolomite and Wilcox zones, it was acidized and flowed 61 bbl. of 43.2-gravity oil net in 24 hours, with 10 per cent water. It averaged 53 bbl. of oil and 10 bbl. of water daily for 11 days. Gas gaged 100,000 cu. ft.

Barry's No. 1-A Smeltzer, NE SW NE Section 35-1n-8, outpost in the Clarita area, Coal County, topped Wapanucka sand at 1,823 ft., total depth 1,954 ft. in shale, was acidized and pumped 15 bbl. of oil and 2 bbl. of water in 24 hours.

Brookshire & O'Mara's No. 1 Jones, SW SW NW Section 29-3s-12e, wildcat in Atoka County, based Cretaceous at 570 ft., driller's top of Mayes formation was 1,945 ft., it was bottomed at 2,045 ft. in Pennsylvanian formation and was dry and abandoned.

Thompson Brothers' No. 1 Meadors, NE NE NE Section 23-9-9, Hughes County wildcat, found Cromwell zone at 3,272 ft., total depth 3,284 ft., had oil showing but water intruded, plugged back and shooting operations failed and it was abandoned.

Walker & Johnson's No. 2 Rogers, NE NE NE Section 24-7-9, Hughes County, had a hole full of water in Calvin sand at 555-575 ft., and was abandoned at 598 ft., total depth.

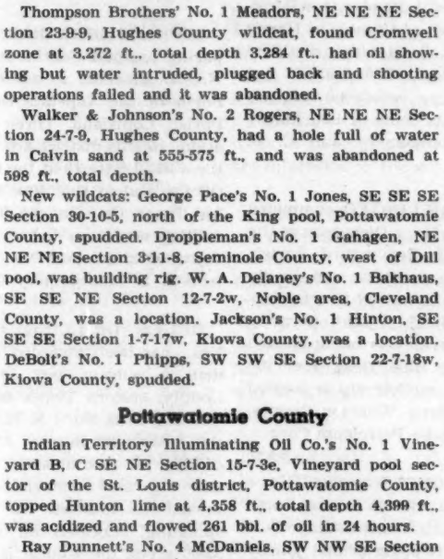
New wildcats: George Pace's No. 1 Jones, SE SE SE Section 30-10-5, north of the King pool, Pottawatomie County, spudded. Droppleman's No. 1 Gahagen, NE NE NE Section 3-11-8, Seminole County, west of Dill pool, was building rig. W. A. Delaney's No. 1 Bakhaus, SE SE NE Section 12-7-2w, Noble area, Cleveland County, was a location. Jackson's No. 1 Hinton, SE SE SE Section 1-7-17w, Kiowa County, was a location. DeBolt's No. 1 Phipps, SW SW SE Section 22-7-18w, Kiowa County, spudded.

Pottawatomie County

Indian Territory Illuminating Oil Co.'s No. 1 Vineyard B, C SE NE Section 15-7-3e, Vineyard pool sector of the St. Louis district, Pottawatomie County, topped Hunton lime at 4,358 ft., total depth 4,399 ft., was acidized and flowed 261 bbl. of oil in 24 hours.

Ray Dunnett's No. 4 McDaniels, SW NW SE Section 31-11-4, Shawnee pool, had Earlsboro sand at 4,432 ft., total depth 4,476 ft., was shot and made daily potential of 313 bbl. of oil.

New work in Pottawatomie County: Kerlyn Oil Co.'s No. 1 School Land B, C S½ NW SE Section 36-7-3, cellar and pits; Magnolia Petroleum Co.'s No. 7 Fyke G, NW NW NE Section 29-7-5, rigging up rotary; George Pace's No. 1 Weiss, NW SW NE Section 36-10-4, building rig.



Midcontinent Map Co., Tulsa

Location for an outpost in the Wetumka area, Hughes County, was reported staked at Ahrens Drilling Co. and others' No. 1 Williams, NE NE NW Section 13-9-10

Estimated Daily Production

Estimated daily production for Oklahoma for the week ended April 6, and for the preceding week was as follows:

	Barrels	
	Apr. 6	Mar. 30
Allen	5,825	5,850
Billings	6,100	6,350
Burbank	7,200	7,150
South Burbank	8,650	8,625
Balance Osage	16,725	16,775
Blackwell district	3,650	3,700
Bristow-Slick	6,050	6,300
Chandler	1,250	1,425
Crescent	2,150	2,300
Cromwell	2,900	2,950
Cushing-Shamrock	9,225	9,475
Duncan	3,700	3,725
Edmond	4,275	4,325
Fish	3,400	3,450
Fitts	18,800	19,700
Jesse	2,200	2,225
Graham-Fox	2,150	2,125
Gray	750	750
Healdton	8,750	8,750
Hewitt	3,950	3,625
Keokuk	3,200	3,225
Konawa	1,200	1,200
Lucien	8,200	8,325
Moore	1,875	2,025
Northeastern counties	17,000	17,000
Oklahoma City	102,500	89,450
Olympic	2,350	2,350
Ramsey	3,800	4,000
Sasakwa	1,650	1,650
Sholem-Alechem	2,900	2,800
Seminole district:		
Bowlegs	7,250	7,450
Carr City	2,400	2,425
Dora	2,200	2,250
Earlsboro	4,400	4,450
South Earlsboro	600	600
East Earlsboro	2,250	2,275
Little River	6,800	6,825
East Little River	725	725
Maud	625	650
Mission	1,325	1,300
Seminole	7,400	7,425
East Seminole	1,150	1,150
Searight	2,400	2,350
Total Seminole	39,525	39,875
St. Louis-Pearson	30,500	31,800
Tatums	1,975	1,825
Tonkawa-Garber-Thomas	4,050	4,075
Wewoka	1,550	1,600
Yale-Jennings	3,550	3,575
Other pools	77,250	78,775
Total Oklahoma	420,775	413,125

Pontotoc County

Hall's No. 1 Summers, SE SW SE Section 26-5-4, Bebee area, Pontotoc County, topped Viola lime at 2,438 ft., total depth 2,634 ft., was acidized and pumped 170 bbl. of oil in 24 hours.

Senora Oil & Gas Co.'s No. 4 Tucker, NW NE NE Section 35-5-4, was shot and pumped 70 bbl. of oil in 24 hours. It topped Viola lime at 2,436 ft., dolomite 2,584 ft., and was bottomed at 2,661 ft.

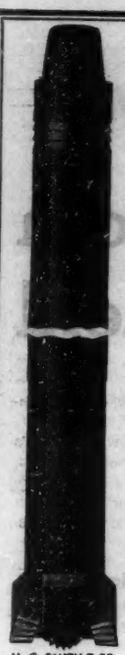
W. A. Delaney's No. 1 Gilmore, NW NW NE Section 28-5-8, Allen field, had sand at 2,266 ft. and was dry and abandoned at 2,318 ft.

W. B. Pine's No. 1 Jetter, SE SE SW Section 26-5-4, was drilling below 1,357 ft.

McClain County

Patsy Oil Co.'s No. 2 James, NE NE NE Section 16-5-3, Byars pool, McClain County, found Viola lime at 3,450 ft., total depth 3,600 ft., was acidized and flowed 1,500 bbl. of oil and 15 per cent water in 12 hours, through ½-in. choke.

(Continued on Page 128)



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Among the Drilling

ROWAN DRILLING CO. abandoned its No. 1 Lobit, a wildcat located in the Cedar Bayou area, Harris County, Texas, and the rig has been moved to Brazoria County for No. 1 McIlvaine, a projected 8,500-ft. wildcat located west of the town of Alvin.

T. A. CARLTON is drilling below 7,900 ft. in No. 1 Bender, a wildcat, east of the town of Humble in Harris County, Texas. Sand with a distillate odor was cored at 7,798-7,806 ft. but drill-stem testing recovered salt water. The well is being drilled jointly with Rod Montgomery and C. B. Bunte.

CROSBY DRILLING CO. completed the company's No. 1 Dickerson at the Bancroft field, Beauregard Parish, Louisiana, as a producer, and the rig is expected to be moved to a new location in the field. A joint operation with T. G. Markley is being started at the Bayou Blue field, Iberville Parish, while another rig is located at the Lissie area, Wharton County, Texas, for Strake Petroleum Corp.

GEORGE ECHOLS spudded No. 1 W. S. Clubb, a wildcat located north of Fannett in Jefferson County, Texas. The well is being drilled jointly with Hebert & Smith. Another operation is reported in the South China field, Jefferson County, while at the League City field, Galveston County, one rig is operating for Phillips Petroleum Co.

CHRISTIAN-CARPENTER DRILLing Co. is moving a rotary to the San Felipe dome, Waller County, Texas, preparatory to deepening John Mayo's No. 1 Rehmann, abandoned a few weeks ago at a total depth of 6,018 ft. The well is scheduled to be deepened to the Cockfield formation.

MARTIN THOMPSON is moving in a rig to the Highlands area, Harris County, Texas, for No. 1 Highlands Farms Corp., a projected 6,500-ft. wildcat situated in the J. White Survey.

HARRY L. EDWARDS DRILLING Co. is preparing to spud L. J. Sessions, a Wilcox test in Grimes County, Texas. Other new operations were started for Pan American Production Co. at the Dickinson field, Galveston County, and at the Old Ocean field for Harrison & Abercrombie.

McDANNALD OIL CO. has two rigs running in the Old Ocean field, Brazoria County, Texas, for Stanolind Oil & Gas Co., and is completing a well for the same company at the Clear Lake field, Harris County. Two rigs are being used to develop the company's holdings at the Port Barre and Magnet fields, while one deep test is being drilled in the Dickinson field for the Pure Oil Co.

NICKLOS DRILLING CO. is preparing to spud Continental Oil Co.'s No. 1 Vincent, a wildcat located north of the Tepetate field, Acadia Parish, Louisiana. Three other operations in this district are reported at the Villa Platte field for Continental Oil Co. and at the Wax Bayou field for Texas Co. On the Texas coast drilling continues below 9,000 ft. at Continental Oil Co.'s No. 1 Bender, a wildcat in Montgomery County.

DELTA DRILLING CO., Tyler, Tex., has been awarded contract to drill a wildcat test in Cherokee County, eastern Texas, for Shell Oil Co., Inc. It is No. 1 S. H. Maness, in the J. Musquez Survey, 11 miles east of Rusk. It is contracted to 4,800 ft. and rig and material are being moved to location for immediate spudding. Located on a block of 3,000 acres, the wildcat is in an area which has been extensively core drilled.

BOB HELM, contractor in the Southeast New Mexico district, has been awarded contract from Gordon M. Cone for his recently-staked wildcat test 3 miles west and slightly north of the High Lonesome field in Eddy County, New Mexico. Materials are being moved to the drill site which is 330 ft. from the north and 2,310 ft. from the east lines of Section 14-16s-28e. This test is to be known as No. 1 Hare.

GRADY VAUGHN DRILLING CO., Dallas, Tex., has been let the contract for drilling a 4,500-ft. wildcat test for Fohs Oil Co., Houston, Tex., in the southwestern part of Harrison County, East Texas border district. Materials are being moved in for the test which is No. 1 R. L. Sypert, 151-acre tract in the Richard Hopper Survey, 2½ miles southwest of Hallsville. The wildcat will explore the Woodbine sand section and possibly the Paluxy of upper Trinity, according to the depth at which the Trinity is topped.

HELMERICH & PAYNE, INC., Tulsa, has started building roads to a new wildcat location in southern

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Andrews County, West Texas. The wildcat is No. 1 University, located 660 ft. from the north and east lines of Section 11, Block 11, University Lands Survey. Contracted to 5,500 ft., the location falls about 3 miles northeast of the active wildcat by Richmond & Hunter in Section 21 of the same block and survey.

G. H. VAUGHN, Dallas, Tex., has the contract for the wildcat, Fohs Oil Co.'s No. 1 Sypert, Hallsville area, Harrison County, Texas.

OLSON DRILLING CO., Tulsa, has started work at its No. 2 Whelan, C NW SW Section 29-31-11w, Whelan pool, Barton County, Kansas. It is a south offset to W. J. Coppinger's No. 1 Whelan, which recently extended the pool about ½ mile northeastward. The area had been dormant for several months before the extension well was started.

J. B. WALTERS, Paola, Kans., drilling contractor, was preparing to start a second well on the Azendorf lease in the Davis-Beagle gas pool, Miami County, Oklahoma. He recently completed Davis Gas Corp.'s No. 1 Azendorf, Section 25-18-22, at total depth of 530 ft. as a gas well. Cable tools are being used.

MITCHELL DRILLING CO., Oklahoma City, Okla., has started work at No. 1 Veverka, C S½ SE SE Section 21-8s-19w, wildcat in Rooks County, Kansas. It is ¾ mile south of the old Webster pool, which produced considerable oil before it was abandoned. Location is about 12 miles southwest of Stockton, the county seat. Rotary tools have been moved in.

HARRY GORE, Wichita, Kans., contractor, was acidizing and preparing to complete Finston & Co. and others' No. 2 Gum, Section 34-19-10w, in the Silica field, Rice County, Kansas. Saturated Arbuckle lime was found at 3,295 ft. and 7-in. casing was set on top of the formation.

E. J. SHAFFER DRILLING CO., Hutchinson, Kans., after long delay, was starting work at C. L. Carlock and others' No. 1 Hoyer, C SE NW Section 6-21-1w, wildcat 2½ miles northwest of the Graber pool in McPherson County, Kansas. Rotary derrick was erected several weeks ago.

E. K. CAREY DRILLING CO., McPherson, Kans., set surface casing at 110 ft. and was drilling ahead with rotary tools at Republic Natural Gas Co. and others' No. 1 Johnson, C N½ NW NW Section 19-20-5w, in the Bornholdt field, McPherson County, Kansas. The Carey company also has contract to drill same operator's No. 2 Knackstedt, C N½ NW NW Section 30-20-5w, same pool.

McPHERSON DRILLING CO. will drill No. 1 Tonkin, SW cor. Section 4-20-12w, wildcat 3½ miles west of the West Ellinwood area in Barton County, Kansas. J. W. Morrow, Wichita, and Fred Steckel, Ellinwood, on whose farm one of the discovery wells of the Silica field was drilled, are interested in the wildcat.

SHOENFIELD, HUNTER & KITCH are scheduled to start work within the next 10 days at Indian Territory Illuminating Oil Co. and Foster Petroleum Co.'s No. 1 Hutton, SW SW SW Section 31-2s-18w, northeast of production in the Frederick deep field, Tillman County, Oklahoma. It will seek an extension of the deep pay.

KERR-LYNN & CO., Oklahoma City, Okla., contractors, were coring Wilcox sand at Continental Oil Co.'s No. 1 Kretchmar, SE SE NE Section 28-28-5w, wildcat north of Medford, Grant County, Oklahoma, after reaming hole. Sand was topped at 5,427 ft. and cored to 5,435 ft. before reaming.

FAIN DRILLING CO., Oklahoma City, Okla., was cleaning out with a hole full of oil at their No. 1 Guthrie, NW NE SW Section 31-21-2w, North Lucien pool, Noble County, Oklahoma. It headed oil and slopped over as the crew drilled in sand topped 5,377 ft. to 5,431 ft., total depth. It was shot with 60 qt. at 5,371-5,407 ft.

BIG CHIEF DRILLING CO., Oklahoma City, Okla., has contract for Johnson & Rollins' No. 1 Little Chief, NE cor. Section 3-5-10w, on the southwest flank of the Cement field, Caddo County, Oklahoma. Location is on a farmout from Sinclair Prairie Oil Co. Contract depth is 5,300 ft.

PORTABLE DRILLING CO., Tulsa, was preparing to test its probable pool opener at No. 1 Teter, NW NW SW Section 24-17-2e, in northwestern Lincoln County, Oklahoma, about 6 miles from the Coyle pool in Payne County. Drilled to 4,779 ft. in dry Wilcox sand, casing was perforated at 4,500-10 ft. in Hunton lime and the well started flowing. It was estimated good for 20,000,000 cu. ft. of gas and from 100 to 500 bbl. of oil.

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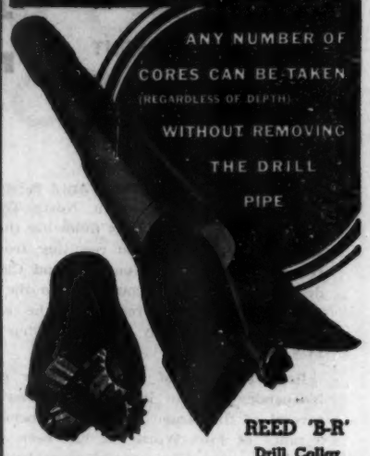

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North and East Texas

By
D. H. STORMONT

North Texas Leasing Spreads To City Limits of Fort Worth

WICHITA FALLS, Tex., Apr. 8. — Continuing to spread and gain momentum, North Texas' extensive leasing campaign, which is following the trend of the Fort Worth syncline and resulting from the several recent discoveries in Montague and Clay counties, is drawing several new counties into the "hot" leasing program. The latest results of the campaign have brought the lease play to the doorstep of the city of Fort Worth.

Representatives of some 10 major companies and independents began last week pricing and blocking several of the larger farms and ranches within 2 or 3 miles of Fort Worth. It has been estimated that nearly a score seismograph crews have been moved into the Fort Worth district, 11 of which are working in Tarrant County. In addition, Sinclair Prairie Oil Co. moved in two seismograph scouts and British American Oil Producing Co. and Mid-Continent Petroleum Corp. each moved in one. The areas being surveyed by the crews include Tarrant, Denton, Wise, Parker, and northern Johnson counties.

In the Benbrook district of Fort Worth Neville G. Penrose acquired two large blocks, one of 3,600 acres and the other consisting of about 3,500 acres. A large portion of the Harrisdale Hereford Farm tract has been acquired by a Fort Worth independent while blocks are reported being taken around Azle, Mary's Creek, and the Edwards ranch. Not only has the search been on land but on water as well. Several operators have approached the Tarrant County water board for prices and possibilities under Lake Worth and Eagle Mountain Lake, the city of Fort Worth's water reservoirs.

Wise County

A new drilling deal in Wise County has been reported completed, Burlingame & Mahan of Graham having announced intentions to drill a 6,000-ft test on a recently acquired block in the J. H. Whitten and S. Wood surveys, 1 mile northwest of Bridgeport. Definite location has not been made and contract has not been let.

Parker County

Announcement of a test in northern Parker County, just south of the Wise County line, was made several weeks ago and it is reported that the test will be drilled some time in the near future. It is E. R. Marchman and Graham's No. 1 G. W. Keeling, a 200-acre tract in the F. Lidley Survey.

Another wildcat test in Parker County being closely watched is I. P. Cowan's No. 1 Mrs. Ella Gilbert, T.&P. Survey, Abstract 1958, 5 miles north of Lipan. The well has been in the process of drilling for almost 2 years and is down to 3,900 ft. It has been testing gas pressure at that depth for several days. However, no oil is reported coming from the hole. Deepening is expected to start within a few days.

Clay County

With the leasing play which started in the northern tier of Texas counties steadily spreading southward, no decline of activity is noticed in the original "hot" area. According to present plans several exploratory tests in Clay County will be under way within the next few weeks. Many of the old 2,000, 3,000, and 4,000-ft. failures drilled within the county in recent years are being prepared for deepening to the lower Bend strata. One of the more definite deals under consideration is Youngblood & Foree's No. 1 Ida Wynne, a failure in Section 2, T.&N.C. Survey, 6 miles northwest of Bellevue, which went to 6,072 ft., in the Ellenburger lime. Part acreage has been reported given to a contractor to rework the hole preparatory to acidizing and testing in the Bend lime.

Under plans for deepening is the old Woods Petroleum Co.'s failure northwest of Henrietta in Block 44, Bosque School Lands Survey, drilled to 4,275 ft. The block is reported being reassembled preparatory to deepening to the Bend horizons. The old Wirt Franklin failure in Block 34, Angelina School Lands Survey, may be deepened, the block having been recently reassembled.

Perhaps most significant of the week's activities was the staking of a new eastern Clay County wildcat by Roy H. Laird. The test was the first activity following the recent discovery in the Omohundro area on the Clay-Montague County line. Laird has turned his 2,950-acre block 1 mile northwest of Ralston and 7 miles northwest of the Omohundro producer to the Harris Drilling Co. for a 6,000-ft. test in the center of Block 40, Madison County School Lands Survey. The new wildcat is 2 miles southwest of the Norwood & Dillard's No. 1 Shipley, a failure at 5,066 ft. or 600 ft. above the Omohundro pay zone. No. 1 Shipley is also under consideration for deepening. In western Clay County another 5,500-ft. wildcat test was preparing to start. It is Staley Oil Co.'s No. 1 Percifield, on the boundary line between Blocks 36 and 37, T. J. Belcher subdivision, 4½ miles southeast of the Halsell 4,700-ft. Strawn sand pool.

Montague County

Closely following the staking of the wildcat in eastern Clay County by Laird and the Harris Drilling Co., a north offset to the Omohundro strike was announced by British American Oil Producing Co. It will be No. 1 J. A. Martin, on the south line of a 322-acre tract in the S½ of Section 27, Block 4. It will be started at once.

A new acreage sale near the Omohundro strike was Barnsdall Oil Co.'s acquisition of 160 acres for a reported sum of $7,200. The lease comprises the SW Section 24, Block 4, H.&T.C. Survey.

NORTH TEXAS COMPLETIONS

Archer County

Chapman & McFarlin's No. 5 L. F. Wilson D, 4,274-83 ft., 960 bbl. C. B. Christie and others' No. 1 L. H. White, 4,346-4,416 ft., 720 bbl. Cities Service Oil Co.'s No. 28 L. F. Wilson C, 4,365-4,405 ft., 1,200 bbl. Continental Oil Co.'s No. 10 L. F. Wilson McCrory, 4,303-70 ft., 1,600 bbl. Deep Rock Oil Corp.'s No. 1 J. H. McCarty, 5,327 ft., dry. Hendrick Oil Co., Ltd.'s No. 1 L. F. Wilson, 4,809 ft., dry. Bert L. Ligon and others' No. 3 J. H. White D, 3,664-3,890 ft., 188 bbl. Bert L. Ligon and others' No. 4 J. H. White D, 497-503 ft., 30 bbl. Bert L. Ligon's No. 3 J. H. White E, 1,617-42 ft., dry.

R. C. Lipscomb and others' No. 3 L. F. Wilson, abandoned location. Martin and others' No. 4 T. B. Wilson, 1,589-91 ft., 15 bbl. Panhandle Refining Co.'s No. 5 F. C. Green C, 1,131-42 ft., 50 bbl. Shappell Oil Co.'s No. 1 A. J. DeMoss, 1,236 ft., dry. L. Sikes' No. 1 L. F. Wilson, 4,018-29 ft., 900 bbl. Waldo E. Stephens, trustee's No. 1 H. E. Adae, 4,989 ft., dry. Young and others' No. 1 C. L. Abercrombie, 1,412 ft., dry.

Baylor County

Hall-Jordan Co.'s No. 1 F. C. Green, 3,061-64 ft., 184 bbl. swabbing, 6 hours.

Clay County

Akin and others' No. 1 J. M. Parker, 1,500 ft., dry. E. N. Costley and others' No. 2 W. J. McInnes B, 1,060-92 ft., 240 bbl. Harvey Drilling Co.'s No. 1 A. Culver, 1,302 ft., dry. W. R. Lyon and others' No. 1 M. Chapin, 1,178 ft., dry. T. A. Norwood and others' No. 1 G. C. Parker, 1,708 ft., dry. G. D. Rigsby's No. 1 fee, 1,340 ft., dry.

Cooke County

Bridwell Oil Co.'s No. 14 J. R. Parker, 727-52 ft., 18 bbl. Peckham's No. 1 J. W. Mount, 1,825 ft., dry.

Jack County

Big 6 Oil Co.'s Nos. 3, 5, and 6, E. F. Smith, abandoned locations. Forbess and others' No. 1 L. Carter, 438-44 ft., 7 bbl. Forbess and others' No. 2 L. Carter, 465 ft., dry. Rowan & Nichols' No. 2 S. E. Rankin, 3,082-3,130 ft., 390 bbl. Rowan & Nichols and others' No. 4 John Matlock, 3,120-39 ft., 375 bbl.

Montague County

Sinclair Prairie Oil Co.'s No. 1 C. Holt, 1,943 ft., dry.

Wichita County

Continental Oil Co.'s No. 4-B J. L. and T. J. Waggoner C, 3,970-86 ft., 240 bbl. J. M. Corbett's No. 2 F. C. Dodson, 1,366 ft., dry. George T. Davis' No. 1 E. Van Houston, 265 ft., dry. Barrow and others' No. 1 C. Birk A, 4,000,4,116 ft., 640 bbl. Granite Oil Trust's No. 3 N. H. Martin, 3,795-3,890 ft., 560 bbl. W. B. Hamilton's No. 2 Martin E, 556-59 ft., 10 bbl. W. B. Hamilton's No. 3, 565 ft., dry.

W. H. Hammon's No. 7 fee, abandoned location. W. H. Hammon's No. 17 S. Mitchell and others, abandoned location. Hanlon-Buchanan, Inc.'s No. 9 Fassett & Tuttle E, 3,996-4,046 ft., 295 bbl. Kimbell and others' No. 2 W. L. Hodges, 3,912-75 ft., 550 bbl. Lawsonia, Inc.'s W. T. Waggoner AA, 1,585-1,613 ft., 105 bbl. Mitchell and others' No. 3 Sue Mitchell, 3,807-66 ft., 900 bbl. George Proctor's No. 2 Ed Foster, 2,038 ft., dry. Target Drilling Co.'s No. 1 William Burnett, 4,000-90 ft., 112 bbl. Tide Water and others' No. 6 Charles Pettit, 3,688-3,793 ft., 1,900 bbl. Mrs. Hulda B. Wallace's No. 1 J. C. Straus, 1,077-88 ft., 100 bbl.

Wilbarger County

W. B. Omohundro and others' No. 2 W. T. Waggoner, 1,115-34 ft., 40 bbl. Paradise Oil Co.'s No. 5 W. T. Waggoner B, 1,534-50 ft., 175 bbl. Staley & Wynne's No. 21 W. T. Waggoner G, 2,417-45 ft., 210 bbl.

Young County

H. Craig's No. 1 C. J. Taack, 696-98 ft., 10 bbl. W. G. Horn's No. 9 W. B. Gegg, 862 ft., dry. C. E. Knox's No. 7 W. D. Worsham, abandoned location. Moran and others' No. 18 W. B. Howard, 945 ft., dry.

EASTERN TEXAS

DALLAS, Tex., Apr. 8.—Four wildcat abandonments, one each in Hopkins, Kaufman, Limestone, and Henderson counties, together with reports that Gulf Oil Corp. is negotiating to purchase the recently indicated Camp County Pettit lime strike, led the activities of the week in eastern Texas. Nothing definite has been announced, but Gulf Oil Corp. was credited during the week with attempting to work out a deal for acquiring H. S. Moss Oil Co.'s No. 1 Joe Venters, Wright Survey, 3 miles southeast of Leesburg. The wildcat, twice abandoned and three times rigged up again for deepening, several weeks ago encountered saturation in the Pettit lime and cemented casing for a test of the section from 7,947 to 8,087 ft., total depth. Delay in drilling the plug has resulted from uncleared title

(Continued on Page 117)

California Field Report

By L. P. STOCKMAN

Unexpectedly Large Output Of Edge Well in E. Coalinga

LOS ANGELES, Calif., Apr. 8.—Tide Water Associated Oil Co. finished a surprising completion in the extreme southeastern end of the East Coalinga field of Fresno County late this week when No. 22 Guardian in Section 2-20-15 was brought in doing 1,350 bbl. of 23.6-gravity oil per day from the Temblor with bottom of the hole at 3,612 ft. This is the largest completion registered in the East Coalinga field in many years and its large production was totally unexpected. Many large wells have been completed during the past 2 years in the Northeast and Southeast Coalinga fields, which are located east of the East Coalinga field, but the productive formation in these districts comes from rocks of Eocene age. Production from No. 22 Guardian is coming from the overlying Temblor which likewise is highly productive in the Kettleman North Dome field. The well was finished with a 7-in. water string cemented at 3,260 ft. and 367 ft. of 5-in. liner landed at 3,607 ft. and perforated for 351 ft above the landing point. It is on a government permit. Standard Oil Co. holds considerable offset acreage.

First production was developed in East Coalinga around 1,887 ft., and work extended to the West Coalinga field with successful results in 1900 and 1901. Up to January 1, 1940, the East and West Coalinga fields had produced 359,889,525 bbl. of crude oil and current production approximates 9,200 bbl. per day. The Coalinga field is one of very few spots in the state where the Cretaceous has been found productive and within the confines of the two fields production is secured from three types of structures, a normal anticline, a syncline and a monocline. Due to limited markets for fuel oil and gasoline during the early life of the Coalinga field, production was rather spotty and limited with the result that peak production was not attained until about 10 years after discovery.

Current production of leading California fields follows:

	Barrels
Wilmington	83,250
Midway-Sunset	52,650
Kettleman Hills	50,750
Long Beach	44,700
Ventura Avenue	31,700
Huntington Beach	27,050
Santa Fe Springs	26,050
Montebello	19,550
Santa Maria Valley	12,050

Southeast Coalinga

Two excellent flowing wells were completed in the Gatchell zone of Eocene age in the Southeast Coalinga field of Fresno County. No. 51-7-F of R. S. Lytle in Section 7-20-16 was brought in flowing 1,980 bbl. of clean 31.9-gravity oil and 1,197,000 cu. ft. of gas per day from 7,958 ft. and No. 77-13-C of Standard Oil Co. in Section 13-20-15 was brought in flowing 1,390 bbl. of clean 31.8-gravity oil and 950,000 cu. ft. of gas daily from 7,789 ft. No. 51-7-F was finished with an 8⅝-in. water string cemented at 7,294 ft. and 700 ft. of 6⅝-in. liner landed on bottom and perforated at 7,300-38 ft., 7,377-7,677 ft., 7,717-97 ft., and 7,837-7,938 ft. and 7,908 ft. of 2½-in. tubing. Kreyenhagen was cored in this well at 6,144 ft., top of the glauconitic was found at 7,244 ft. and top and bottom of the productive Gatchell zone was logged at 7,289 ft. and 7,940 ft. respectively. R. S. Lytle also completed No. 86-12-C in Section 12-20-15 at 6,892 ft., but no gage has yet been taken.

No. 77-13-C Standard Oil Co. is located on fee-owned acreage and has an elevation of 782 ft. above sea level. It was finished with a 7-in. water string cemented at 7,350 ft. and 465 ft. of 5-in. liner landed on bottom and carrying perforations at 7,400-7,789 ft. and 7,759 ft. of 2½-in. tubing. Top of the Kreyenhagen was cored at 6,012 ft., top of the glauconitic was found at 7,430 ft. and top and base of the productive Gatchell zone was logged at 7,430 ft. and 7,746 ft. respectively. This gives the well a penetration of 316 ft. into the highly productive Gatchell sand. It was brought in flowing through a 42/64-in. to 6/64-in. bean and showed a tubing pressure of 1,075 lb. and a casing pressure of 1,350 lb. No. 51-7-F R. S. Lytle was brought in flowing through a 26/64-in. bean and showed a tubing pressure of 1,250 lb. and a casing pressure of 1,400 lb.

Northeast Coalinga

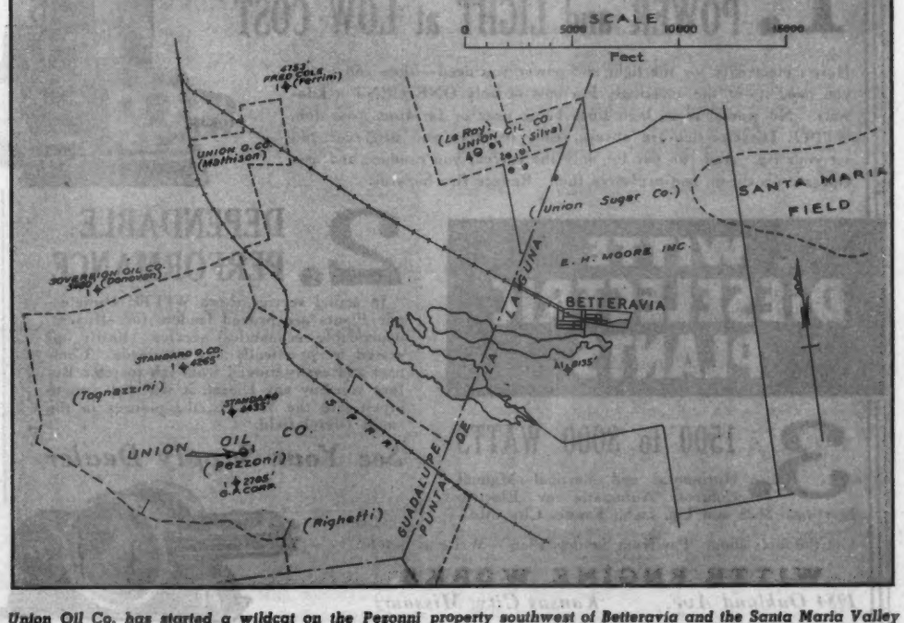
Standard Oil Co. completed No. 71-19-B on fee acreage in the Northeast Coalinga field, flowing 1,186 bbl. of 26.9-gravity oil and 736,000 cu. ft. of gas daily from the Gatchell zone with bottom of the hole at 8,255 ft. No. 71-19-B was brought in flowing through a 40/64-in. to 5/64-in. bean during the initial flow period and showed a tubing pressure of 1,050 lb. and a casing pressure of 1,300 lb. This new well was finished with a 7-in. water string cemented at 7,895 ft. and 437 ft. of 5-in. liner landed at 8,254 ft. and carrying perforations at

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	March 31		March 24			
	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Intercoastal-domestic—						
Crude oil	72,220	10,317	.....	.....	72,220	185,791
Fuel oil	.....	.....	.....	.....	152,798	450,002
Diesel and gas oil	.....	.....	.....	.....	.....	163,501
Gasoline	202,999	29,000	98,931	14,133	751,841	311,275
Kerosene	.....	.....	.....	.....	.....	122,200
Foreign exports—						
Crude oil	417,110	59,587	145,224	20,746	3,494,728	3,745,437
Fuel oil	178,639	25,520	121,677	17,382	1,897,634	2,180,474
Diesel and gas oil	164,974	23,568	43,404	6,201	1,680,997	1,311,715
Gasoline	82,030	11,719	118,246	16,892	1,253,679	1,989,500
Kerosene	9,678	1,383	2,950	421	288,473	457,309
Lubricants	.....	.....	40,698	5,814	40,698	42,034
Coastwise-domestic—						
Crude oil	110,141	15,734	113,181	16,169	2,500,809	2,655,887
Fuel oil	413,603	59,086	265,312	37,902	3,875,962	2,209,784
Diesel and gas oil	53,684	7,669	34,945	4,992	776,255	673,860
Gasoline	442,751	63,250	69,219	9,888	3,597,201	3,245,387
Kerosene	5,083	726	10,212	1,459	120,999	120,259

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic—						
Fuel oil	.....	.....	.....	.....	68,740	.....
Diesel and gas oil	.....	.....	.....	.....	281,260	69,550
Asphalt	.....	.....	.....	.....	73,200	74,746
Lubricants	.....	.....	.....	.....	7,606	4,170
Foreign exports—						
Crude oil	407,614	58,231	286,287	38,041	1,065,949	1,295,067
Fuel oil	41,937	5,991	88,607	12,658	324,689	650,005
Diesel and gas oil	61,576	8,797	163,743	23,378	598,575	359,799
Gasoline	97,083	13,869	56,529	8,076	559,153	893,813
Kerosene	18,070	2,581	.....	.....	102,929	262,209
Lubricants	3,686	527	11,180	1,597	94,517	163,196
Other finished oil	.....	.....	133	19	250	120
Coastwise-domestic—						
Fuel oil	74,915	10,702	130,406	18,629	1,531,418	1,534,037
Diesel and gas oil	9,127	1,304	23,990	3,427	317,152	201,917
Gasoline	88,455	12,636	120,863	17,266	1,849,571	1,309,387
Kerosene	3,313	473	9,585	1,369	150,088	173,289



Union Oil Co. has started a wildcat on the Pezonni property southwest of Betteravia and the Santa Maria Valley field in an area that has not been sectionized and which shows considerable merit

8,125-8,254 ft. The liner was cemented through perforations at 8,120 ft., and production was brought in flowing through 8,235 ft. of 2½-in. tubing. Top of the Kreyenhagen was found at 6,880 ft., glauconitic at 7,780 ft. and Gatchell zone at 7,910 ft. Standard Oil Co. has assumed an aggressive exploitation program in the Northeast and Southeast Coalinga fields where it has considerable fee acreage and recently has erected seven derricks and has four additional locations staked for early work.

Greeley

Standard Oil Co., on the north flank of the Greeley field of Kern County, completed No. 12-7 Kern County Land in Section 7-29-26, flowing 3,005 bbl. of 34.6-gravity oil and 2,520,000 cu. ft. of gas daily from the equivalent of the Rio Bravo and Vedder zones at 11,510 ft. This new well is located east of the Oughton, Sullivan and Farrand properties of General Petroleum Corp. and Scofield lease of Superior Oil Co. on which several excellent flowing wells have been completed to date. It was finished with a 7-in. water string cemented at 11,193 ft., 415 ft. of 5-in. liner landed at 11,509 ft. and carrying 80-mesh perforations at 11,277-11,509 ft., and 11,487 ft. of 3-in. tubing. The liner was cemented through perforations at 11,273 ft. Top of the Rio Bravo zone was cored at 11,277 ft. and lower Rio Bravo or Vedder zone at 11,302 ft.

Superior Oil Co. is making preparations to drill on the Merrill lease. The location is C SW SW SE Section 1-29-25.

Rio Bravo

In the Rio Bravo field of Kern County Union Oil Co. completed No. 56-27-Kern County Land in Section 27-28-25, flowing 973 bbl. of 38.6 gravity oil and 1,049,000 cu. ft. of gas per day from the Rio Bravo zone with bottom of the hole at 11,500 ft. The well was brought in flowing through an 18/64-in. bean and showed a tubing pressure of 1,625 lb. and a casing pressure of 1,800 lb. The high pressures and the small flow bean used indicate that the initial production does not represent the well's maximum capacity. The hole was finished with a 7-in. water string cemented at 11,298 ft., 215 ft. of 5-in. liner landed at 11,495 ft. and carrying perforations at 11,325-11,466 ft. and 11,480-91 ft. and 11,461 ft. of 2½-in. tubing. The well, instead of being swabbed into production, was rocked in with gas and responded in good shape. Top of the productive Rio Bravo zone was cored at 11,327 ft. In the northwest end of the field, Superior Oil Co. is scheduled to complete No. 3 Fink in Section 27-28-25 within the next 3 weeks, after which another location will be made in the northwest trend.

There has been a very definite trend to extend drilling operations to the northwest and the productive limits of the Rio Bravo field may be extended another mile beyond present production in Section 27-28-25. This eventuality would be favorable to several independent companies which hold acreage in the trend of development.

Wilmington

Union Pacific Railroad Co., largest single holder of productive acreage in the Long Beach Harbor section of the Wilmington field, listed two new completions. No. 5 Pacific Dock was brought in flowing 640 bbl. of 20.7-gravity oil per day from the Ranger zone at 2,755 ft. and No. 22-E, which was finished, flowing 225 bbl. of 28.6-gravity oil daily from the Terminal zone at 4,021 ft. No. 5 Pacific Dock was finished with a 7-in. water string cemented at 2,510 ft. and 344 ft. of gravel-packed 4¾-in. liner landed on bottom and carrying perforations at 2,435-92 ft. and 2,512-2,755 ft. and 2,386 ft. of 2½-in. tubing. No. 22-E of Union Pacific Railroad Co. was finished with an 11¾-in. water string cemented at 2,491 ft. and 1,733 ft. of combination 8⅝-in. and 6⅝-in. liner landed at 4,017 ft. and cemented through perforations at 3,209 ft. and 3,419 ft. The lower 586 ft. of this combination liner consisted of 6⅝-in. Perforations were at 3,216-3,307 ft., 3,320-64 ft., 3,421-3,511 ft., 3,529-3,600 ft., 3,620-78 ft., 3,688-3,728 ft., 3,758-3,832 ft., 3,852-3,940 ft. and at 3,960-4,017 ft.

Continental Corp. (no relation to Continental Oil Co.), completed another excellent well on the west bank of the Los Angeles Flood Control Channel when No. 1 L.A.C.F.C. was brought in flowing 670 bbl. of clean 17.4-gravity oil per day through a 34/64-in. bean from the Ranger zone with bottom of the hole at 2,932 ft. This is the third good well completed on this lease which, on the surface, consists of a long narrow strip just wide enough to sustain the necessary derrick and drilling equipment. Wells are started down straight and later deviated beneath the flood control channel by directional drilling.

J. E. O'Donnell completed No. 1 Cliff in the Wilmington field and it showed an initial production of 126 bbl. of 14.5-gravity oil per day from the Ranger zone with bottom of the hole at 3,407 ft. Production was brought in flowing through a 22/64-in. bean. The hole was finished with a 6⅝-in. water string cemented at 3,085 ft. and 359 ft. of 4¾-in. gravel-packed liner landed at 3,405 ft. and perforated at 3,082-3,405 ft.

Dominguez

R. E. Havenstrite has completed his second outpost in the extreme west end of the Dominguez field, No. 2 Larronde, flowing 1,530 bbl. of clean 31.2-gravity oil and 1,000,000 cu. ft. of gas per day from the eighth Callender zone with bottom of the hole at 7,583 ft. No. 2 Larronde was finished with a 7-in. water string cemented at 7,053 ft. and 556 ft. of 5⅞-in. liner landed at 7,583 and perforated at 7,025-7,225 ft. opposite the seventh Callender zone and at 7,380-7,583 ft. opposite the eighth Callender zone. This well is west of No. 1 Larronde, which Havenstrite completed several months ago, and while the correlation points indicate the structure to be plunging to the northwest, the production of No. 2 Larronde was much larger than that of the discovery well, and the sand appeared to be of a better texture. The recent abandonment of No. 1 Grant by Pongratz Petroleum Co., near Main Street, took a lot of interest away from the district, but completion of No. 2 Larronde indicates the possibility that edge production may yet be developed substantially to the west but definitely south of the location upon which No. 1 Grant was drilled. Union Oil Co., after considerable study, took a lease on the Gardenia Syndicate property which is west of the company's Callender lease and north of the Larronde property of R. E. Havenstrite in the west end of the Dominguez field and preparations are under way to begin early work.

Rosecrans

Development work in the Rosecrans field of Los Angeles Basin resulted in the starting of several wells and

(Continued on Page 128)

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Kansas Developments

By
DAL DALRYMPLE

Extend Rock Pool Southward; Wild Gas Well in Lyons Pool

Field activity continued to increase throughout Kansas last week, with the expected revival in the Forest City basin sector in the northeastern part of the state getting under way as new tests were started in Johnson, Jefferson, and Nemaha counties. Several pool extensions were assured and a gas well in the Lyons pool got out of control and was blowing wild at the week end.

The wild gasser was Mitchell Drilling Co.'s No. 1 Sangster, C E half SE SW Section 11-20-8w, Rice County, about 1½ miles southeast of the town of Lyons. It is believed the trouble resulted from a leak in casing 175 ft. belowground when efforts were made to shut off a strong gas flow found in Simpson sand at around 3,280 ft. Flowing under 1,000-lb. pressure, it still was defying efforts to curb the flow at the week end more than 30 hours after it had got out of control. The gas, damp and heavy, remained near the ground due to weather conditions, presenting a serious fire hazard and endangering traffic and operations at other wells and nearby salt mines.

E. B. Shawver and Stelbar Oil Corp.'s No. 1 Davis, NE NW NE Section 21-30-4, extended the Rock pool, Cowley County, ½ mile southward. It drilled Burbank sand at 2,751-93 ft., total depth, and was completed for initial daily potential of 368 bbl. of oil.

The Orth pool was extended 1½ miles eastward at Vickers Petroleum Co.'s No. 1 Behnke, CWL NW NW Section 25-18-10w, Rice County. It made initial potential of 210 bbl. of oil daily at total depth of 3,259 ft. after acidizing Arbuckle lime.

Champlin Refining Co. extended Simpson production in the South Snider pool, Stafford County, westward at No. 1 Smith, SE NE NE Section 17-21-11w. Bottomed at 3,421 ft. in Simpson dolomite, it made initial potential of 51 bbl. of oil daily.

A ½-mile northeast extension of the Iuka pool, Pratt County, was indicated at Magnolia Petroleum Co.'s No. 1 Beck, C W½ NW NW Section 12-27-13w. It topped Simpson dolomite at 4,279 ft. and found saturation in a core at 4,291-95 ft., total depth. Five-inch casing was set at 4,291 ft., preparatory to testing.

Rice County

C. L. Carlock's No. 2 Renollet, NW NW SE Section 36-20-8w, Wherry pool, Rice County, had conglomerate at 3,319-24 ft., total depth 3,326 ft., pumped 172 bbl. of oil in 8 hours and made 24-hour potential of 517 bbl.

Shell Oil Co., Inc.'s No. 3-A Brothers, C S½ S½ NW Section 31-20-7w, pumped 265 bbl., of oil in 8 hours and made daily potential of 794 bbl., with 5,330,000 cu. ft. of gas. Pay was found at 3,281-3,321 ft.

Cities Service Oil Co.'s No. 2 Hathaway, C S½ NE SW Section 27-19-10w, Silica field, had Arbuckle lime at 3,271 ft., and was abandoned at 3,311 ft., total depth, after pumping 80 bbl. of oil and 75 bbl. of water in 12 hours, and later pumping 10 bbl. of oil and 300 bbl. of water in 22 hours.

Vickers Petroleum Co.'s No. 1 Scott, C E½ SW NE Section 20-20-10w, was building rotary rig.

McPherson County

Bennett & Crossman's No. 3 Wiles, C S½ S½ NE Section 25-19-2w, Ritz-Canton area, McPherson County, had Mississippi pay at 2,980-83 ft., was bottomed at 2,993 ft., flowed 50 bbl. of oil daily before acidizing, and pumped 84 bbl. of oil in 8 hours and made daily potential of 253 bbl. of oil after acidizing.

Stafford County

Stanolind Oil & Gas Co.'s No. 9 Martin, C E½ SW NW Section 14-24-11w, Zenith field, Stafford County, found Viola lime at 3,815-46 ft., total depth, flowed 68 bbl. of oil in 1 hour, flowed 72 bbl. the next hour, and was completed for maximum allowable potential of 3,000 bbl. of oil.

Same company's No. 1 Helmers, C E½ NE NW Section 1-22-12w, was a location. The company's No. 5 Sims, C S½ NE NE Section 11-24-11w, was building rotary rig, and the No. 10 Martin, C W½ SW NW Section 14-24-11w, was a location.

Among the Wildcats

Ray, Reed and others' No. 1 Axton, SE NW NE Section 17-28-11, wildcat in the Severy area, southern Greenwood County, found Topeka lime at 760-65 ft., total depth, and was estimated good for 30 bbl. of 30-gravity oil daily.

Atlantic Refining Co.'s No. 1 Smith, SE SE NW Section 33-33-4, Cowley County wildcat, topped Arbuckle lime at 3,699 ft. and was dry and abandoned at 3,736 ft.

C. F. Meyers and others' No. 1 Dunn, NW cor. Section 33-34-5, wildcat in Cowley County, found Arbuckle lime at 3,469 ft., and was dry and abandoned at 3,510 ft.

Estimated Daily Production

Estimated daily production for Kansas for the week ended April 6, and for the preceding week, was as follows:

	Barrels	
	Apr. 6	Mar. 30
Oxford City	700	650
Burrton	9,200	9,250
Ritz-Canton	4,100	4,150
Graber	3,100	3,300
Hollow-Nikkel	1,800	1,850
Lerado	1,000	1,300
Voshell	1,700	1,750
Wellington	2,100	2,000
Ellsworth County:		
Lorraine	1,150	1,700
Other pools	2,120	1,995
Rice-Barton counties:		
Bloomer	4,950	5,150
Chase	4,350	5,200
Genesco	2,800	3,450
Raymond	500	650
Silica	12,150	13,650
Keesling	1,050	1,000
Wherry	3,650	3,850
Miscellaneous Rice	3,175	2,605
Miscellaneous Barton	8,135	8,595
Trapp district	14,700	14,200
Balance Russell County	21,200	20,550
Sedgwick County	3,350	3,350
Ellis County:		
Bemis	6,950	8,200
Miscellaneous	4,535	3,350
Kingman County	840	895
Stafford County	7,295	7,195
Greenwood County	8,250	7,750
Eldorado	7,200	7,200
Other fields	33,300	35,615
Total Kansas	175,350	180,400

Greenwood County

A. M. Landon's No. 2-B Johnson, NE NW NW Section 22-24-12, Hamilton area, Greenwood County, pumped 35 bbl. of oil daily and was completed in Bartlesville sand at 1,596-1,625 ft., total depth.

Arch Miller and others' No. 1 Hancock, NW cor. Section 18-27-11, spudded and shut down.

Cowley County

Western Kansas Oil & Royalty Co.'s No. 6 Ferguson, NW SE SW Section 21-30-8, West Ferguson area, Cowley County, found Kansas City lime at 2,167-74 ft., total depth, was acidized and estimated good for 30 bbl. of oil daily.

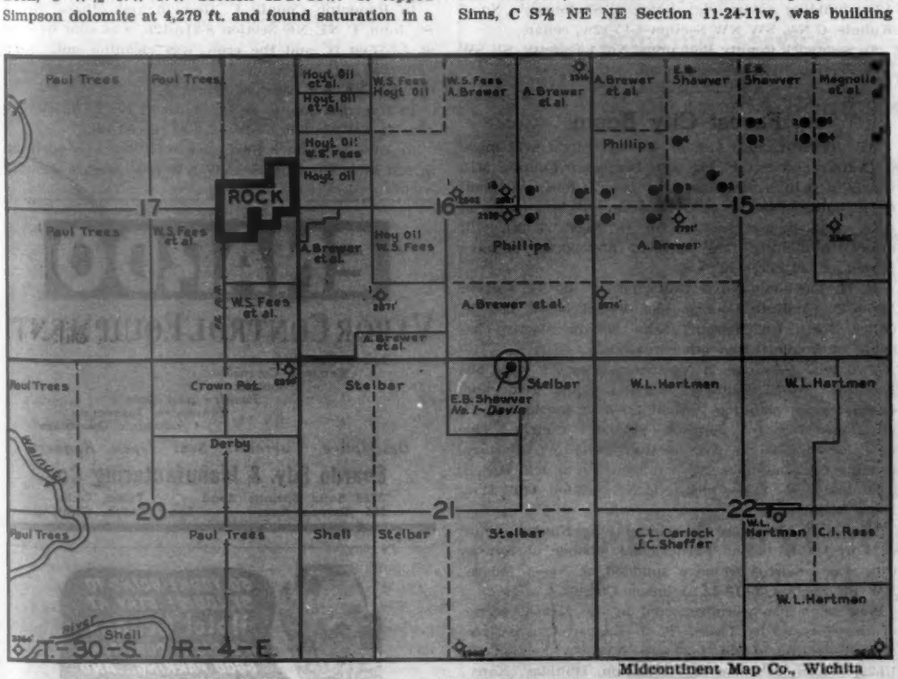
Sumner County

Slocum & Elmeyer's No. 1 McLaughlin, NW cor. Section 10-35-2e, Padgett area, Sumner County, had Mississippi lime at 3,453-3,503 ft., total depth 3,510 ft., and pumped 18 bbl. of oil and 17 bbl. of water daily.

Stevens County

Stevens County Oil & Gas Co.'s No. 1 McClure, C Section 16-32-38w, Hugoton field, Stevens County, was acidized and completed for 21,000,000 cu. ft. of gas daily. It had Winfield pay at 2,540-90 ft., and 2,615-25 ft., total depth 2,630 ft.

United Production Co.'s No. 1 Miller, SW SW SE Section 24-33-39w, set casing and was waiting on cement



Midcontinent Map Co., Wichita

The Rock pool in Cowley County was extended ½ mile southward at E. B. Shawver and Stelbar Oil Corp.'s No. 1 Davis, NE NW NE Section 21-30-4. It made initial potential of 368 bbl. of oil from sand at 2,751-93 ft.

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at 500 ft. Parker and others' No. 1 Crawford, C SW NE Section 30-33-37w, was a location.

Rooks County

Schermerhorn Oil Co.'s No. 1 Smith, C E½ NE NW Section 13-9-17w, Westhusin area, Rooks County, had Lansing lime at 3,209-25 ft., total depth 3,470 ft., and made initial daily potential of 64 bbl. of oil.

Ellis County

Gulf Oil Corp.'s No. 9 Mai, C N½ NE SE Section 14-11-17w, Bemis field, Ellis County, swabbed 62 bbl. of oil in 2 hours; was acidized, and daily potential was calculated at 3,051 bbl., with 270 bbl. of water. Production was from Arbuckle lime at 3,359-67 ft., total depth.

Butler County

Associated Oil & Gas Co.'s No. 6-A Cook, SW NE NE Section 4-26-5, El Dorado field, Butler County, was completed in Viola lime at 2,579-97 ft., total depth. It was acidized and pumped 30 bbl. of oil in 24 hours.

Al Beckner's No. 1-A Balzer, NE SE SW Section 32-26-6, Garden area, topped Bartlesville sand at 2,638 ft., Mississippi lime at 2,767 ft., and was dry and abandoned at total depth of 2,839 ft.

Rex & Morris' No. 1 Towle, SE SE SE Section 20-26-7, Guenther area, pumped 50 bbl. of oil in 24 hours from Mississippi pay at 2,743 ft. Seven-inch casing was set on top of pay.

Skelly Oil Co.'s No. 43 Hazlett, NW SE SE Section 19-25-5, El Dorado area, was completed as a water disposal well at 2,857 ft., total depth.

Rex & Morris' No. 1 Lane, SW SW NW Section 21-26-7, was rigging up machine.

Miscellaneous Reports

In Barber County Olson Oil Co.'s No. 2 Whelan, C NW SW Section 29-31-11w, was a cellar.

In Barton County Stanolind Oil & Gas Co.'s No. 7 Rose, C W½ W½ NE Section 3-20-11w, location; Crown Petroleum Co.'s No. 1 Hall, C W½ SW SE Section 6-20-11w, cellar; Phillips Petroleum Co.'s No. 2 Petz, C E½ SW NE Section 7-20-11w, location; Black & Marshall's No. 3 Weber, C N½ NW SE Section 14-16-12w, ponds.

Ellsworth County: Gulf Oil Corp.'s No. 2 Svoboda, C E½ NE SE Section 8-16-10w, rigging up rotary; Barnsdall Oil Co.'s No. 1 Stoppel, SW SW NW Section 26-16-10w, location.

Graham County: Continental Oil Co.'s No. 1 Loveridge, C W½ W½ SE Section 10-9-21w, building rotary rig.

In Marion County Herrington and others' No. 1 Deines, NE cor. Section 29-17-4, rigging up machine.

Russell County: Mid-Continent Petroleum Co.'s No. 2 Rogg, C S½ NW NE Section 32-14-13w, cellar; same company's No. 1 Shaffer, NW NW SW Section 35-14-13w, building rotary rig; Jones & Shelburne's No. 5 Kuhnle, C N½ SW NW Section 4-15-12w, cellar.

In Sedgwick County Polhamus' No. 1 Garetty, SE SW NW Section 16-28-1e, rigging up.

Forest City Basin

ST. JOSEPH, Mo., Apr. 8.—Carter Oil Co. will move a stratigraphic rotary rig into Buchanan County, Missouri, to drill a slim-hole test near Agency, a small town southeast of this city. Location will be announced this week, it was said. John H. Reed, Tulsa, will direct the drilling. The company is reported to have purchased 20 acres in fee.

E. H. Lawhon's No. 1 Gottschall, C SE SE Section 18-59-32w, DeKalb County, has drilled below 200 ft. Other Northwest Missouri tests remain inactive because of financial and other reasons.

Two new locations in Northeast Missouri were announced. T. E. Baldwin, Wichita Falls, Tex., and associates are planning to drill 1,000 ft. south of their abandoned No. 1-A Johnson, Schuyler County. The new location is in SW Section 21-65-15w. Eastern Drilling Co. of Kansas City has contract to drill Harris & Holmes' No. 1 Newkirk, NE NE Section 11-61-11w, Knox County.

New tests also were reported in the Kansas sector of Forest City basin. Frederick J. Casper of Kansas City was reported to have spudded at No. 1 Moore, NW SE Section 33-13-22, Johnson County.

New tests also were reported in the Kansas sector of the Forest City basin. F. J. Kasper, trustee, has started drilling at No. 1 Moore, NW SW Section 33-13-22, Johnson County. J. G. Gatton, Halliday, Kans., has the contract to drill to Bartlesville sand or deeper, if necessary. Elevation is 963 ft. The operator believes this test has a good chance to find oil in the lower Bartlesville or Burgess formations. The operator, who has a considerable block of acreage in the area, recently completed a gas discovery well 2½ miles north of the Gardner pool.

McLaughlin Sons, Inc., of Des Moines, has given contract to W. D. Wilson, Independence, Kans., to drill another test for gas near their Jefferson County gas discovery well, in SW NE NW Section 4-10-20. The new location is in C NW SW Section 4-10-20. The discovery well, not yet completed, will supply gas for the new operation.

S. B. Hibbard and J. C. Bumpus of Kansas City are reported to have contracted with Earl Wakefield, Wichita contractor, for a well in SE NW Section 12-4s-14, about 8 miles south and 4 miles west of Fairview, Nemaha County, Kansas. Carter Oil Co. and Amerada Petroleum Co., holding acreage in the area, are contributing to the test, which is scheduled to go to Arbuckle lime. Location is about 12 miles west of a slim-hole test recently completed by the Carter company in Brown County, Kansas.

In the Falls City, Neb., area, Pawnee Royalty Co.'s No. 1 Boice, C NE NE Section 18-1n-16e, discovery well, is being deepened. Drilling was resumed after Hunton lime pay at 2,279-87 ft. had been cemented off. Both oil and water was slopping over the top and the drill was making slow progress. The operators were reported planning to start a test in Section 17-1n-16e soon, but location has not been announced.

Ed Uhri of Humboldt, Kans., and Joe Higgins, Lincoln, have notified M. J. Lewis, drilling contractor, they are ready to start work at No. 1 Ogle, NE NW SE SE Section 9-1n-14, Richardson County. Uhri and H. B. Stephens, Humboldt, have made arrangements for casing for their No. 1 Stauffer, SW SW NE Section 22-1n-13e, Richardson County, and are preparing to resume drilling at about 550 ft.

Oscar Gruber has resumed drilling at No. 1 fee, C SW SE Section 8-67n-40w, Fremont County, Iowa, after a long shutdown. Hole was being made below 1,300 ft.

Indiana Fields

(Continued from Page 101)

NW Section 34-3s-14w, was shot with 20 qt. at 2,150-59 ft. and 600 ft. of fluid rose in the hole; cleaning out.

Northern Wildcats

Vaughn & Smith had machine on the ground for No. 1 Yacup, SW SE Section 33-32-8w, Newton County.

In Jay County D. Davis' No. 1 Perry, NW NW NE Section 17-24n-12e, was drilling below 300 ft.

In Madison County Frontier Petroleum Co. was rigging up No. 1 A. U. L. Insurance Co., SW NW SE Section 8-21n-8e.

In Randolph County C. Godwin and others' No. 1 St. John, C NE NE Section 8-21n-12e, was shot in sand at 1,257-60 ft. and the crew was cleaning out. John Seip was drilling below 575 ft. in No. 1 Johnson, SW cor. NE NE NW Section 9-19n-13e.

In Hancock County D. D. Chaffee's No. 1 Brock, SW cor. NE SW Section 6-16n-6e, was rigged up.

In Greene County Sheckard & Ryan were drilling at 620 ft. in No. 1 Kiser, NW NW NW Section 4-7n-5w.

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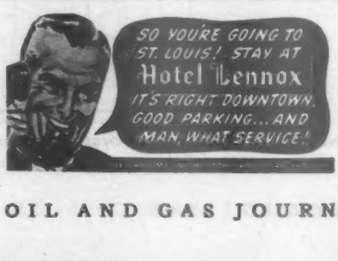

Commonwealth's No. 1 Tucker, NW cor. NE SE NE Section 16-6n-6w, was drilling at 370 ft.

In Putnam County C. L. Williams had rig up for No. 1 Cooper, SW cor. NE Section 10-13n-4w.

In Owen County Urban Oil Co.'s No. 1 Everhart, C S½ NE SE Section 21-9n-5w, was drilling below 790 ft.

In Sullivan County Forest Petroleum Corp.'s No. 1 Riggs, NW NE SW Section 33-9n-9w, was drilling at 970 ft.

In Ripley County Stoll Oil Refining Co. abandoned No. 1 Franks, in SW NE NW Section 14-7n-11e, at 1,598 ft., the hole filled with sulfur water from sand at 1,411-16 ft.

In Sullivan County Joe Young and others' No. 1 Shepard, C N½ SE NE Section 13-6n-10w, was running casing to 867 ft.

In Knox County M. I. T. Syndicate's No. 1 McHenry, in Donation 214-5n-9w, was drilling at 3,642 ft. Sun Oil Co.'s No. 1 Utt, Donation 182-4n-9w, had Aux Vases sand at 1,493 ft. and Ste. Genevieve lime at 1,517 ft., and was drilling at 1,544 ft.

Southern Tests

In Warrick County S. R. Travis and others' No. 1 Moyer, NW SW NW Section 13-5s-9w, was at a total depth of 1,450 ft., and the crew was underreaming 6-in. casing.

In Vanderburg County Vanderburgh Oil Corp.'s No. 11 Hornby, SE NW SW Section 33-5s-10w, was drilling at 1,150 ft. with the hole full of water.

East Texas Fields

(Continued from Page 112)

to the Venters land. At last reports the deep test was still shut down with plug undrilled.

Further reports are that the Gulf Pipe Line Co. has surveyed a proposed carrier from the indicated well to connect with the Oklahoma-Texas trunk line. It is also reported that Gulf is negotiating for acreage in the Moss block held by W. C. McGlothlin of Corsicana, who started the wildcat some 2 years ago. In the immediate area of the deep test Gulf Oil Corp. holds 1,593 acres and Tide Water Associated Oil Co. holds 500 acres. Several miles east and north of the test and in Morris County Gulf is reported to have leased a block of 4,245 acres extending from the east line of the county north of Daingerfield and south of Omaha to the west line. Price was reported to be from $1 to $2.50 per acre.

Abandonments

Three of the district's abandonments during the week were listed as official in Hopkins, Kaufman, and Limestone counties. The fourth abandoned test, in Henderson County, was reported dry as the week closed. It is Hager's No. 2 Faulk & Coleman, Rayburn Survey, on the northwest side of La Rue dome. The test topped Woodbine sand at 4,197 ft. and an electrical survey of the hole showed it carries only water.

Opelika Area

Definite assurance that Lone Star Gasoline Co. of Dallas and Shamrock Oil & Gas Co. of Amarillo are planning a development program in the deep Opelika gas and distillate area in Henderson County was seen when the Texas Railroad Commission granted the firms permits for recycling operations.

The partnership is authorized to produce gas wells at 25 per cent of their open flow in recovery of the distillate content. Lone Star and Shamrock several weeks ago bought from the Tide Water-Seaboard partnership their properties in the deep area, the property consisting of approximately 8,500 acres, two lower Trinity series distillate wells and a small oil well. The plant to be constructed by the new operating partnership is to have a daily capacity of 50,000,000 cu. ft. of gas, and the entire construction cost is expected to approximate $500,000.

East Texas Field

An interesting feature was noted during the past month of March in the East Texas field. Abandonments of exhausted oil wells in the large field continued to exceed new wells, according to Railroad Commission reports. The report showed 26 old wells plugged during the month and 24 wells completed. Sixty-eight wells were removed from the production schedules during the month and 34 were reinstated, the report stated.

EAST TEXAS FIELD COMPLETIONS

(One-hour gages)

Gregg County—Longview Area

Coastal Development Co.'s No. 20 J. J. Flewellen, 3,628-48 ft., 40 bbl.

Gregg County—Kilgore Area

Roosth-Gencov's No. 1 Kilgore National Bank, 3,549-90 ft., 21 bbl. Sinclair Prairie Oil Co.'s No. 63 A. A. King, 3,439-3,502 ft., 60 bbl.

EAST CENTRAL TEXAS COMPLETIONS

(24-hour gages)

Anderson County

Cayuga field: Carter-Gragg Oil Co.'s No. 6 W. H. C. Goode, 3,990-97 ft., 195 bbl.

Long Lake field: Hunt Oil Co.'s No. 3 R. B. Hatchcock, 5,320-25 ft., 84 bbl.

Hopkins County

A wildcat, W. P. Vaughn's No. 1 May Chapman, F. Hopkins Survey, 1 mile north of Tira, topped Woodbine 2,540 ft., topped Georgetown lime 3,220 ft., topped the Paluxy 3,934 ft. and dry and abandoned at total depth of 4,064 ft.

Franklin County

Talco field: Stroube-Stroube's No. 8 Norman Prince, abandoned location.

Kaufman County

A wildcat, Groginski & Gannon's No. 1 E. H. Brown, M. Reynolds Survey, 5½ miles southwest of Kaufman, topped Pecan Gap 1,110 ft., topped Austin chalk 1,790 ft., based Austin chalk 2,295 ft., topped Woodbine at 2,722 ft., dry and abandoned at 3,042 ft.

Limestone County

A wildcat, J. J. Tyrell's No. 1 Easterling, J. L. Chavert Survey, 11 miles east of Groesbeck, dry and abandoned at 4,655 ft.

Titus County

Talco field: V. A. Hughes' No. 5 Flannagan, 4,325-42 ft., 325 bbl.

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Southwest Texas District

Distillate Well Marks First Tertiary Wilcox Discovery

By
F. L. SINGLETON

CORPUS CHRISTI, Tex., Apr. 8.—The Southwest Texas district received its first Tertiary Wilcox sand pool when Atlantic Refining Co. uncovered distillate production in the Thomaston area, De Witt County, with the completion of No. 1 Conwell. While no gage was available at the close of the week, the well was reported to be making a large volume of distillate while flowing into tanks through a $\frac{7}{8}$-in. choke on tubing and a ¼-in. choke on casing. Working pressure on the tubing was 2,300 lb. and on the casing 2,400 lb. The well is making an estimated 20,000,000 cu. ft. of gas daily. This well has been in the process of completion for several days. It was drilled to 8,518 ft., and 5½-in. casing was cemented at 8,291 ft. Drill-stem testing through perforated casing at 8,000 ft., 8,100 ft., and 8,200 ft., recovered salt water, and final completion was made through perforated casing at 7,855-85 ft.

Anderson-Prichard Oil Co. and Mills Bennett Production Co. continues to test No. 2 D. E. Robinson in the West Tuleta field, and the well is showing distillate while testing the Carrizo sand at 7,545-50 ft. During a 36-hour drill-stem test ending at 7 p.m., April 3, the well flowed an estimated 25 per cent distillate and 75 per cent brackish water under a maximum pressure of 900 lb. It is flowing 1,065,000 cu. ft. of gas daily. The Carrizo is the lower member of the Mt. Selman formation. Several sands logged in the Wilcox were tested, but all showed various quantities of salt water.

Another Frio-Vicksburg discovery looms for Starr County as Sun Oil Co.'s No. 1 Lehr recovered 50 ft. of oily mud and 90 ft. of pipe-line oil on a 25-minute drill-stem test at 4,125-39 ft. The test was made through a ¼-in. choke on top and bottom of the testing tool The well is drilling ahead below 4,305 ft., after drill-stem testing at 4,153-62 ft. and 4,163-75 ft. recovered several feet of gas-cut drilling mud. The possible discovery is about 7½ miles southwest of the Sun field in C.C.S.D.&R.G.N.G. Survey 513.

In the same county, and about 5 miles northeast of the Sun field and 2½ miles south of the Kelsey field, Sun Oil Co. was preparing to test No. 1 Rodriguez. The well was drilled to 7,502 ft., and 5½-in. casing was cemented below 6,500 ft. The completion of the well will more or less determine whether or not the two fields are on separate structures.

Sultex Oil Co.'s No. 1 J. C. Wood, J. McGeehans Survey, Bee County, topped sand showing oil and gas at 5,682 ft., and the formation was cored to a total depth of 5,684 ft. Three attempts to drill-stem test the section failed, and the company is attempting to retest before coring ahead. The sand section is thought to be the Cockfield.

Northwest of the town of Telferner and located in the Telferner gas field, Victoria County, Colton & Colton were preparing to test No. 1 Buhler, which showed promise of opening the first crude oil production in the area. The well is bottomed at 2,698 ft., with 5½-in. casing cemented at that point. Oil sand was recovered in cores at 2,693-98 ft., and casing was cemented following a 5-minute drill-stem test at 2,694-98 ft., which recovered 70 ft. of pipe-line oil. A previous test at 2,690-98 ft., tested 400 lb. working pressure, 60 ft. of oily mud, and 30 ft. of oil.

Location for another wildcat was announced for the county as Humble Oil & Refining Co. prepared to spud No. 1 R. H. Welder, situated on a block of several thousand acres in S.A.&M.G. Survey 9, about 2 miles northeast of Nursery.

Two more producers were added to the Wade City field, Jim Wells County, and drilling operations were expected to be increased, as the district was given its first pipe-line outlet. The new producers were Arkansas Fuel Oil Co.'s No. 1 McNeill, completed through perforated casing at 4,925-33 ft., for an initial production of 148 bbl. in 15 hours flowing through a $\frac{7}{16}$-in. choke, and Rodney DeLange and others' No. 4 McNeil, completed in sand at 4,923-40 ft. for an initial production of 373 bbl. daily, flowing through a $\frac{7}{16}$-in. choke. Southern Minerals Corp. recently completed a short line to the field, and posted a price of 91 cents for 20-gravity oil with a 2-cent differential up to $1.19 for 33 gravity and above.

In the South Alfred field, Jim Wells County, I. K. Howeth and others' No. 1 Robert Adams, Waldron Oil & Gas Subdivision, is bottomed at 4,872 ft., and the company is running an electrical survey. Sand with an oil odor was cored at 4,690-93 ft., and a 3-minute drill stem test at 4,585-93 ft., tested 48-lb. working pressure and 400 ft. of fluid of which 65 per cent was oil and 35 per cent mud. The well was cored ahead, logging sand with an oil odor at 4,693-4,711 ft.

In the Fagan field, Refugio County, Barnsdall Oil Co. was retesting No. 2 Fagan, following a drill stem test at 6,063-73 ft., which recovered salt water. The well was drilled to a total depth of 6,150 ft., and 5½-in. casing was cemented at 6,110 ft.

Seaboard Oil Corp.'s No. 1 Lovett, East Mathis area, San Patricio County, is preparing to test after cementing casing on bottom at 5,695 ft. Drill-stem testing at 5,612-27 ft., recovered several hundred feet of oily mud and 68 lb. of working pressure. Location is in Section 131, Paul Subdivision of the Welder ranch. Southwest of Sinton, Tex., Gulf Producing Co. is drilling in shale below 7,275 ft. in No. 1 San Antonio Loan & Trust Co. This well looms as a probable pool opener as drill-stem testing at 6,662-72 ft. recovered an unestimated amount of distillate and several hundred pounds of working pressure.

SOUTHWEST TEXAS COMPLETIONS IN PROVEN FIELDS

Aransas-San Patricio Counties

Bay-Tex Oil Corp.'s No. 1 Anderson-Trout, perforated casing 7,156-59 ft., 113 bbl., $\frac{7}{16}$-in. choke. F. A. Gillespie and Sons' No. 1 Clark-Hill, perforated casing 7,113-18 ft., 102 bbl., ¼-in. choke. Tom Graham's No. 1-G McCampbell, 7,830 ft., dry and abandoned. H. H. Howell's No. 1 Gilcrease, perforated casing 7,442-55 ft., 100 bbl., ⅜-in. choke. L. L. Smith's No. 1 Nelson, perforated casing 6,794-6,800 ft., 100 bbl., ½-in. choke. Southern Minerals Corp.'s No. 2 Carlock, 7,160 ft., 110 bbl., ½-in. choke. Texas Atlas Corp.'s No. 1-17 Richmond, perforated casing 7,107-14 ft., 98 bbl., $\frac{7}{16}$-in. choke.

Caldwell County

Dale field: Ralph Ogden's No. 5 Talley, 2,190 ft., dry and abandoned.

Duval County

Cedro Hill field: Humble Oil & Refining Co.'s No. 6-F Duval County Ranch Co., 1,444 ft., 14 bbl., 15 hours pumping. Texas Co.'s No. 37 Duval County Ranch Co., sand 1,445-52 ft., 19 bbl., 18 hours, ⅝-in. choke. Chiltipin field: Gray & Wolfe's No. 4 Graham, 5,054 ft., dry and abandoned. Driscoll field: Continental Oil Co.'s No. 47-A Driscoll, perforated casing 3,330-52 ft., 289 bbl., ¼-in. choke. Hoffman field: Highland Oil Co.'s No. 17 Hubbard, 3,012 ft., dry and abandoned. Muralla field: Sun Oil Co.'s No. 1 Valerio, perforated casing 4,704-07 ft., 67 bbl., pumping and flowing. Tarancahuas field: Cox, Hamon and others' No. 3 Hoffman, sand 2,044-54 ft., 135 bbl., ⅝-in. choke. Cox, Hamon and others' No. 5 Hoffman, 2,903 ft., dry and abandoned.

Guadalupe County

Elm Creek field: E. A. Weyel's No. 2 Mattke, 720 ft., 5 bbl., pumping.

Jim Hogg County

Colorado field: Humble Oil & Refining Co.'s No. 4 King ranch, 3,059 ft., 184 bbl., $\frac{7}{16}$-in. choke. Kelsey field: Humble Oil & Refining Co.'s No. 71 McGill, 4,743 ft., 97 bbl., 9/64-in. choke.

Jim Wells County

Ben Bolt field: Heyser & Heard's No. 3 Garcia, perforated casing 5,246-61 ft., 368 bbl., $\frac{7}{16}$-in. choke. H. H. Howell's No. 2 Whatley, perforated casing 5,323-29 ft., 278 bbl., $\frac{7}{16}$-in. choke. Magnolia City field: V. J. Meyer and others' No. 3-A Shear, perforated casing 5,712-20 ft., 131 bbl., ¼-in. choke. Reynolds field: H. J. Mosser's No. 1 fee, 5,607 ft., dry and abandoned. Wade City field: Rodney DeLange's No. 3 McNeill, perforated casing 4,931-39 ft., 347 bbl., $\frac{7}{16}$-in. choke.

McMullen County

Munson field: Ben Robertson's No. 1 Nueces Land & Livestock Co., 1,186 ft., dry and abandoned.

Milam County

Rockdale field: H. H. Coffield's No. 1 Niehaus-Isaacs, 775 ft., 5 bbl., pumping. H. H. Coffield's No. 4 Niehaus, 741 ft., 7 bbl., pumping.

Nueces County

Agua Dulce field: Union Producing Co.'s No. 2-B Ingram, 7,300 ft., dry and abandoned. Union Producing Co.'s No. 3 Wallace, perforated casing 4,588-4,622 ft., gas well. Ciara Driscoll field: O. W. Killam's No. 5 Webb., perforated casing 5,108-14 ft., 77 bbl., 16 hours, ½-in. choke. Minnie Bock field: Phillips Petroleum Co.'s No. 3 Gandy, 4,082 ft., dry and abandoned. Saxet field: Hiawatha Oil & Gas Co.'s No. 8-B Smith, perforated casing 6,270-76 ft., 28 bbl., 5/32-in. choke.

Refugio County

La Rosa field: Hewitt & Dougherty's No. 10-B Rooke, perforated casing 5,420-28 ft., 5,743-49 ft., 92 bbl., ⅝-in. choke. Shield Oil Co.'s No. 5 Sasse, perforated casing 5,403-11 ft., 133 bbl., ½-in. choke.

San Patricio County

East White Point field: Houston Oil Co.'s No. 10 Baldwin, perforated casing 5,695-5,707 ft., 138 bbl., 5/32-in. choke. G. J. Lee's No. 1 McGinn, perforated casing 5,670-74 ft., 134 bbl., ½-in. choke. Republic Natural Gas Co.'s No. 29 Rachal, perforated casing 5,538-48 ft., 134 bbl., ½-in. choke.

Starr County

Sun field: Humble Oil & Refining Co.'s No. 1 Montalvo, 4,933 ft., 123 bbl., 9/64-in. choke. Sun Oil Co.'s No. 9 McKinney, perforated casing 4,619-27 ft., 29 bbl., $\frac{7}{16}$-in. choke.

Victoria County

Cologne field: Houston Oil Co.'s No. 1 Reeves, perforated casing 3,863-69 ft., gas well. Victoria field: Barnsdall Oil Co. and others' No. 14 Pickering, perforated casing 6,017-27 ft., 113 bbl., 15 hours, 7/64-in. choke. Bill Hardin's No. 1 Buckert, perforated casing 3,040-43 ft., 167 bbl., ¼-in. choke. E. R. Kirkpatrick's No. 1 Deaver, sand 3,045-55 ft., 160 bbl., $\frac{7}{16}$-in. choke.

Webb County

Adami field: Red Bank Oil Co.'s No. 8 Adami, sand 997-1,000 ft., 116 bbl., pumping. Red Bank Oil Co.'s No. 7 Adami, sand 997½-1,003 ft., 57 bbl., pumping. Volpe field: Magnolia Petroleum Co.'s No. 26 Volpe, sand 2,457-77 ft., 144 bbl., ¼-in. choke.

Zapata County

Mirando Valley field: Interstate Minerals, Inc., 1,850 ft., dry and abandoned.

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ont., Apr. 6.—Crude and naphtha production from all Alberta fields in February totaled 639,952 bbl. compared with 471,050 bbl. in January. Turner Valley limestone crude increased from 432,294 to 602,364 bbl. Naphtha production through separators was down from 8,758 to 8,552 bbl. and absorption-plant gasoline declined from 27,180 to 25,707 bbl. Shallow crude increased from 522 to 663 bbl. Red Coulee light crude declined from 1,062 to 976 bbl. and Wainright heavy crude from 688 to 675 bbl. Dina-Ribstone field, with two wells, was down from 300 to 225 bbl. but the two Terminal wells in the Del Bonita field increased their output from 246 to 790 bbl.

The increase was due almost entirely to increased allowables in the Turner Valley crude area, with the addition of three new crude-oil wells, bringing the total of crude-oil wells to exactly 100.

Absorption gasoline production included 13,149 bbl. from Royalite Oil Co.'s No. 1 plant and 4,208 bbl. from No. 2; with 4,392 bbl. from Gas & Oil Products and 3,958 bbl. from British American Oil Co. Output of the Royalite's No. 1 plant was stimulated by the seasonal demand for gas.

Allowables Are Increased

Effective March 27, Turner Valley aggregate allowable was stepped up from 15,000 to 20,000 bbl. a day for 100 wells. Another increase is anticipated about the middle of April.

Turner Valley Completions

In Section 33-20-3w5, North Turner Valley, allowable of Home Oil Co.'s No. 3, LSD 1, finished in the black lime at 8,311 ft., has been stepped up from 300 to 456 bbl. a day, making it the second largest well in the field. Permanent allowable will be set after tests of bottom-hole pressure are completed. The three Home producers in North Turner Valley now have an aggregate of 1,320 bbl. a day.

As a result of tests made with various diameters of tubing in Home's No. 3, the company is planning to use 3-in. tubing in all future completions. With the 3-in. pipe the well produced 111 bbl. an hour compared with 78 bbl. with 2½-in. tubing under otherwise similar conditions.

In Section 5-19-2w5, West Central Turner Valley, Vanpeg Royalties' No. 1, LSD 9, finished at 7,072 ft., has been acidizing and testing in the lower porous zone, and will later acidize the upper lime.

In Section 13-19-3w5, Arrow Royalties' No. 1, LSD 16, finished at 8,102 ft. after drilling 482 ft. in the Madison, has finished major acid treatment, and is continuing production tests.

In Section 6-19-2w5, East Crest Oil Co.'s No. 5, LSD 9, is below 7,588 ft. after getting the Madison lime at 7,316 ft. The upper porous zone was somewhat thicker than in East Crest's No. 4, and indicated more porosity. No. 4 was a small producer, with 100 bbl. allowable.

Southwest Field

In Section 8-18-2w5, Southwest Turner Valley, Northwest-Hudson's Bay Co.'s No. 3, LSD 15, is in the Blairmore formation below 7,071 ft.

In Section 17-18-2w5, Royalite Oil Co.'s No. 50, LSD 7, is below 6,275 ft. after getting the Jumping Pound sand at 5,510 ft.

(Continued on Page 137)

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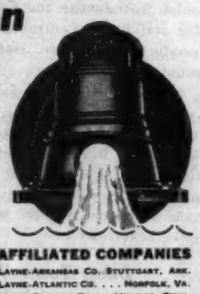

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Michigan Field Report

By
OTTO C. PRESSPRICH

New Holland Pool Will Have Small Area; Many Dry Holes

SAGINAW, Mich., Apr. 8.—Led by a well good for 960 bbl. a day, natural production, Michigan field operations last week resulted in the completion of 16 new oil wells, with total initial production estimated at more than 2,700 bbl. Four tests were failures in what had appeared to be a possible new field in Holland Township of southwestern Michigan's Ottawa County.

While only the Allen County fields of the southwestern part of the state continued to develop on a par with the pace of recent weeks and activities and new production dwindled in the Kent and Ottawa areas, increasing activity in Central Michigan was reflected in new production in Clare, Isabella, Midland, and Tuscola counties.

The week's biggest well was the American Drilling Co.'s No. 10 Newcomer in Section 32, Redding Township, Clare County, and next best were the Gulf Refining Co.'s No. 2 Burch in Section 17, Wise Township, Isabella County, and Pure Oil Co.'s No. 29 Narmore in Section 15, Porter Township, Midland County, both of which were good for 300 bbl. a day, initially, after they were acid-treated.

Deep Tests Were Dry

Meanwhile operators abandoned two Central Michigan deep wildcat projects as C. L. Maguire, Inc.'s No. 1 Clark in Section 32, Warren Township, Midland County, was plugged after being drilled to 4,663 ft. and Union Drilling & Producing Co.'s No. 1 Riggs, a wildcat in Section 11, Hayes Township, Clare County, was abandoned at 4,235 ft.

Seven of the 15 tests found dry and abandoned during the week were operations in Ottawa County; four were in Holland Township, where a flurry of drilling was prompted by completion a few weeks ago of No. 1 Reimold in Section 34 for natural production of 250 bbl. a day, which was heralded as the discovery well in a new field or a sizable extension to the Walker-Wyoming-Tallmadge field of Kent and Ottawa counties.

The Tallmadge area contributed four new oil wells, their initial production after acidizing being small.

Wiser Oil Co.'s No. 4 Jurries, in Section 34, of Overisel, Allegan County, was the best of the three Allegan producers. Others were a 30-bbl. completion in Section 34 of Overisel and a 50-bbl. well in Monterey Township, while a Salem Township test in Section 14 was dry and abandoned. To the west, in Berrien County, Clapsaddle & Harris' No. 1 Brant, a wildcat in Section 7, was abandoned as a dry hole at 992 ft., and in Kent County the only new producer was Certain-Teed Products Co.'s No. 14 fee in Walker Township, the well producing 169 bbl. a day after acidizing. Other Kent activity included abandonment of a Caledonia Township wildcat test by Seaboard Oil Co. of Delaware, and a Wolverine Natural Gas Co. failure in Section 28 of Walker. Other southwestern Michigan wildcat failures included Flanigan's No. 1 Gillhespy in Section 8 of Chester Township, Ottawa, and Fowler's No. 1 Albrecht in Section 8 of Ottawa's Jamestown.

There was some revival of interest in Monroe County as Clark & Johnson's No. 1 Osterhour, Section 30, Dundee Township, was completed for natural initial of 184 bbl. a day, and Skinner & Shiffman's No. 1 Rowe, same section, rated 40 bbl. a day after being acid-treated. A dry hole and a 250-bbl. completion in Bloomingdale Township, and a 50-bbl. well in bordering Columbia was the extent of Van Buren County activity.

Although the Holland Township situation flattened out, 4 of the 20 new drilling permits issued during the week by the Conservation Department were for that township. Allegan, Isabella, Kent, and Van Buren each accounted for three, while Shiawassee, Clare, and Ionia got one each. The other is for an Allendale Township wildcat test in Ottawa. The Isabella permit is for an extension test of the Sherman field, while the Ionia test is for a wildcat planned for drilling in Campbell Township.

Following is the summary of the Michigan completions last week:

Allegan County

Monterey Township (3n-13w)—Regis Cook's No. 1 Wright, SW SW SW Section 19, completed at a depth of 1,723 ft. and treated with acid, produced initially at the daily rate of 50 bbl.

Overisel Township (4n-14w)—N. R. Dodd's No. 1 Otto Schaap and others, NE NE SW Section 34, was rated at 30 bbl. a day, after acid treatment, at a depth of 1,440 ft., and in the same section Wiser Oil Co.'s No. 4 Justin Jurries, NE SW SE, was completed for an initial daily production of 200 bbl., after the hole was acidized, total depth 1,491 ft.

Salem Township (4n-13w)—Dry at 1,670 ft., J. W. Floto and others abandoned No. 1 Winchester, SW SE NE Section 14.

Berrien County

Coloma Township (3s-17w)—Clapsaddle & Harris' No. 1 Brant, SE NW SE Section 7, was abandoned dry at 992 ft.

Clare County

Hayes Township (19n-4w)—A Michigan deep test was recorded as unsuccessful when Union Drilling & Producing Co.'s No. 1 A. Riggs and others, C S½ SW SE Section 11, was abandoned at 4,235 ft.

Redding Township (19n-6w)—American Drilling Co. completed No. 10 Ida B. Newcomer at 3,882 ft., getting the best producer in Michigan in weeks when the well's natural potential was 960 bbl. a day.

Isabella County

Wise Township (16n-3w)—After acidizing, Gulf Refining Co.'s No. 2 Minna Burch, SE NE SW Section 17, was rated at 300 bbl. a day; total depth 3,754 ft. Cryden Petroleum Co.'s No. 1 L. Coyne, SE NE SW Section 20, was a failure.

Kent County

Caledonia Township (5n-10w)—Seaboard Oil Co. of Delaware's No. 1 Ray A. Hodges, SE SW SE Section 22, drilled to 2,231 ft., was abandoned as a dry hole.

Walker Township (6n-12w)—Certain-Teed Products Co.'s No. 14 fee, NW NW NW Section 3, produced initially at the rate of 169 bbl. a day from a depth of 1,784 ft., after it was acid-treated.

Walker Township (7n-12w)—Wolverine Natural Gas Corp.'s No. 1 Minna Muth, SE SE NW Section 28, was dry and abandoned at 1,975 ft.

Midland County

Porter Township (13n-1w)—Pure Oil Co.'s No. 29 Mina B. Narmore, SE NW NW Section 15, rated 300 bbl. a day, after an acid treatment; total depth 3,388 ft.

Warren Township (16n-2w)—C. L. Maguire, Inc.'s No. 1 Charles Clark, SE SE SE Section 32, was abandoned as dry at 4,663 ft., a record depth for the area.

Monroe County

Dundee Township (6s-6e)—B. J. Skinner and D. F. Shiffman's No. 1 Albert Rowe, NE SE SE Section 30, at a depth of 2,117 ft., rated 40 bbl. a day, after it was acid-treated. Much better was F. D. Clark and C. C. Johnson's No. 1 Edgar Osterhout, NE NW NW Section 30, completed at 2,099 ft., with a natural production of 184 bbl. a day.

Ottawa County

Blendon Township (6n-14w)—Homer Fulton abandoned No. 1 Cornelius Wittingen, SE SE SE Section 28, when the test was dry at 1,722 ft.

Chester Township (9n-13w)—James E. Flanigan's No. 1 George Gillhespy, NW NE NW Section 8, was dry and abandoned at 2,588 ft.

Holland Township (5n-15w)—Four tests in the vicinity of the recent No. 1 Reimold "discovery" well were abandoned. Red-Man Oil Co. and others' No. 1 H. J. Heinz Co., SW NW SE Section 27, was abandoned at 1,640 ft., after which Twin Drilling Co. halted operations at 495 ft. in No. 1 A. C. Keppel estate and others, SE NE NW Section 27. Crown Development Co.'s No. 2 Reimold, NE SW NE Section 34, was abandoned at 1,555 ft., and the same company's No. 1 Teuntje Bloemers, SE NE NW Section 34, was plugged after reaching a depth of 1,643 ft.

Jamestown Township (5n-13w)—Howard O. Fowler, trustee's No. 1 W. Albrecht, NW SW NW Section 8, was a dry hole at 1,747 ft.

Tallmadge Township (7n-13w)—George Kernodle's No. 1 Hildring, Smith & Cook, NW SE NE Section 23, was completed for an initial of 100 bbl. a day, after it was acidized at a depth of 1,874 ft., Twin Drilling Co.'s No. 8-B Frank D. McKay, NW SW NW Section 24, completed at 1,903 ft., was good for 30 bbl. a day after acidizing, and American Drilling Co.'s No. 4 John Zokoe, NW SE SW Section 24, completed at 1,884 ft., produced 60 bbl. a day, after it was treated. West Michigan Consumers Co.'s No. 1 Sutter and others, NW SE SE Section 28, was producing 10 bbl. a day from 1,893 ft., after acidizing.

Tuscola County

Wisner Township (14n-7e)—R. J. Munger, trustee, and Brehm Oil Co.'s No. 1 Harriet McPherson, NE SW NE Section 25, total depth 3,442 ft., was good for 60 bbl. a day, after a nitroglycerin shot.

Van Buren County

Bloomingdale Township (1s-14w)—A. E. Kopprasch, trustee's No. 1 J. Bockler, NE NW SW Section 5, was dry and abandoned at 1,222 ft. Bloomingdale Development Co., Inc.'s No. 6 Decker, NW SW SE Section 7, rated 250 bbl. a day from a depth of 1,207 ft., after acid treatment.

Columbia Township (1s-15w)—Carl J. Westlund's No. 1 Nellie Moseman, NE SW NE Section 23, completed at 1,183 ft., and acid-treated, was producing initially at the rate of 50 bbl. a day.

Western Kentucky

(Continued from Page 101)

others' No. 1 Mrs. M. Dickson, moved in and shut down. Utica district: C. E. Daugherty and others' No. 4 N. C. Howard and Rex O'Flynn, dry hole through Jones sand.

Henderson County, Corydon district: Sun Oil Co. and Kentucky Natural Gas Co.'s No. 3 George F. Trigg, cored 12 ft. of McClosky lime, total depth 2,629 ft.; set 5½-in. casing.

Livingston County, 2 miles north of Tiline: M. D. Master's No. 1 H. F. Well, abandoned at 519 ft.

McLean County, East Livermore district: W. E. Hupp and others' No. 2 Owen Vandiver, dry hole through McClosky lime, total depth 1,699 ft.

Ohio County, Pattyville district: William Hunt and others' No. 4 W. H. Davidson. 25 bbl., Jett sand, total depth 325 ft. Sunnydale district: M. Parrott's No. 4 Lee Lewis, spudding in; skidded rig 10 ft. from No. 3; total depth 473 ft.

Webster County, 5½ miles southwest of Clay: Altman Brothers' No. 1 A. B. Vaughn, dry hole, total depth 1,101 ft.

WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S. T. R.	Depth	Status
Union Oil, No. 76 Callender, Dominguez, L. A.	32- 3-13	6,991	sd. sh. drlg.
Shell Oil, No. 102 Reyes, Dominguez, L. A.	33- 3-13	8,065	O.S. drlg.
Havenstrite, R. E., No. 2 Larronde, Dominguez, L. A.	32- 3-13	7,583	flow 1,550 b.d.
Morton & Elder, No. 2 Dominguez, Dominguez, L. A.	3- 4-13	7,426	P.B. 7,100
Apex Pet., No. 1 Hatfield, Rosecrans, L. A.	20- 3-13	9,196	sd. sh. drlg.
Union Oil, No. 39 Rosecrans, Rosecrans, L. A.	19- 3-13	7,950	flow 505 b.d.
Union Oil, No. 40 Rosecrans, Rosecrans, L. A.	19- 3-13	5,081	sd. sh. drlg.
Royalty Service, No. 1 Cement, Rosecrans, L. A.	20- 3-13	9,148	no kick
Kelly & Sons, No. 2 McMillen, Rosecrans, L. A.	20- 3-13	7,050	sd. sh. drlg.
Thorley Oil, No. 1 Athens, Rosecrans, L. A.	7- 3-13		rigged up
El Rey Oil, No. 1 Westmore, Athens, L. A.	2- 3-14	9,063	sd. sh. drlg.
Turf Oil, No. 1 H.R.A., Potrero, L. A.	34- 2-14	6,179	P.B. 4,910
Tide Water A. O., No. 12 Porter, Aliso Canyon, L. A.	27- 3-16	7,551	testing
Tide Water A. O., No. 13 Porter, Aliso Canyon, L. A.	27- 3-16	2,797	sd. sh. drlg.
Brit. Amer. Oil, No. 1 Perkins, Newhall, L. A.	14- 3-16	4,432	sd. sh. drlg.
Consolidated Pet., No. 4 Needham, Newhall, L. A.	13- 3-16	4,401	cleaning out
Barnsdall Oil, No. 9 R.S.F., Newhall, L. A.	27- 4-17	7,195	O.S. drlg.
Barnsdall Oil, No. 10 R.S.F., Newhall, L. A.	26- 4-17	5,740	sd. sh. drlg.
General Pet., No. 7 Blinn, Wilmington, L. A.	35- 4-13	3,300	completing
Barnhardt & Morrow, No. 1 Comm., Wilm., L. A.	32- 4-13	3,575	pump 125 b.d.
Continental Corp., No. 1 L.A.C.F.C., Wilm., L. A.	2- 5-13	2,932	flow 670 b.d.
Continental Corp., No. 5 L.A.C.F.C., Wilm., L. A.	2- 5-13	2,481	sd. sh. drlg.
Franco-Amer. Pet., No. 2 Harbor, Wilmington, L. A.	35- 4-13	1,998	sd. sh. drlg.
Hancock Oil, No. 15-A Harbor, Wilmington, L. A.	35- 4-13	4,063	completing
Long Beach Dev., No. 10-W-X Harbor, Wilm., L. A.	3- 5-13	4,094	completing
Long Beach Dev., No. 11-W Harbor, Wilm., L. A.	3- 5-13	2,671	sd. sh. drlg.
MacMillan Pet., No. 6 Hayes, Wilmington, L. A.	3- 5-13	2,632	sd. sh. drlg.
O'Donnell, J. E., No. 1 Cliff, Wilmington, L. A.	35- 4-13	3,408	flow 127 b.d.
Padreson Oil, No. 1-A Harbor, Wilmington, L. A.	35- 4-13	3,431	completing
Union Pacific R. R., No. 131, Wilmington, L. A.	3- 5-13	5,297	completing
Union Pacific R. R., No. 133, Wilmington, L. A.	3- 5-13	5,014	redrlg. 2,870
Union Pacific R. R., No. 134, Wilmington, L. A.	3- 5-13	4,040	sd. sh. drlg.
Union Pacific R. R., No. 135, Wilmington, L. A.	4- 5-13	5,197	sd. sh. drlg.
Union Pacific R. R., No. 137, Wilmington, L. A.	4- 5-13	2,900	sd. sh. drlg.
Union Pacific R. R., No. 22-E, Wilmington, L. A.	3- 5-13	4,021	flow 220 b.d.
Union Pacific R. R., No. 23-E, Wilmington, L. A.	3- 5-13	1,947	sd. sh. drlg.
Union Pacific R. R., No. 24-E, Wilmington, L. A.	3- 5-13	2,190	sd. sh. drlg.
Union Pacific R. R., No. 5-P.D., Wilmington, L. A.	3- 5-13	2,755	flow 610 b.d.
Wilbur, V. R., No. 3 Kreiger, Wilmington, L. A.	32- 4-13	2,710	sd. sh. drlg.
West Whittier Oil, No. 1 Pellissier, Whittier, L. A.	17- 2-11	4,430	redrlg. 3,191
Kern Oil, No. 34 Monterey, Montebello, L. A.	2- 2-12	7,665	O.S. drlg.
Kern Oil, No. 3 Eggleston, Montebello, L. A.	2- 2-12	2,277	sd. sh. drlg.
Bush Oil, No. 2 Mihlfred, Montebello, L. A.	3- 2-12	8,481	P.B. 7,720
C. A. P. Oil, No. 1 Dutch, Montebello, L. A.	11- 2-12	7,657	redrlg. 7,530
Columbia Oil, No. 1 Schelnik, Montebello, L. A.	3- 2-12	8,154	P.B. 7,970
Getty-Pac. West., No. 1 Star, Montebello, L. A.	10- 2-12	4,363	sd. sh. drlg.
Grace Oil, No. 1 Duhrsen, Montebello, L. A.	3- 2-12	7,505	O.S. drlg.
Mabee Co., No. 39 Monterey, Montebello, L. A.	2- 2-12	7,713	O.S. drlg.
Mabee Co., No. 43 Monterey, Montebello, L. A.	2- 2-12	7,451	sd. sh. drlg.
Mono Oil, No. 1 Foreman, Montebello, L. A.	2- 2-12	7,790	sd. sh. drlg.
Montebello Oil, No. 2 Wallace, Montebello, L. A.	3- 2-12	3,386	sd. sh. drlg.
Texas Co., No. 4 Wilcox, Montebello, L. A.	3- 2-12	3,995	sd. sh. drlg.
Winlock Oil, No. 1 Win, Montebello, L. A.	11- 2-12	7,590	cleaning out
Allied Pet., No. 34 Signal, Long Beach, L. A.	30- 4-12	10,065	fish D.P.
Unity Oil, No. 1 Donna, Long Beach, L. A.	24- 4-13	2,338	sd. sh. drlg.
Kern Oil, No. 1 Signal, Long Beach, L. A.	24- 4-13	3,623	sd. sh. drlg.
Sunset Oil, No. 2 Whitney, Long Beach, L. A.	19- 4-12	2,084	sd. sh. drlg.
Johnson Drlg., No. 40 Signal, Long Beach, L. A.	13- 4-13	3,702	pump 120 b.d.
Dormax Oil, No. 2 Signal, Long Beach, L. A.	30- 4-12	3,360	sd. sh. drlg.
Texas Co., No. 10-A Davidson, Long Beach, L. A.	19- 4-12	4,715	pump 52 b.d.
Exeter Oil, No. 3 Olson, Long Beach, L. A.	19- 4-12	3,998	sd. sh. drlg.
Dunlap, D. D., No. 13 Signal, Long Beach, L. A.	19- 4-12	2,853	sd. sh. drlg.
Great Northern Oil, No. 1 Oak, Richfield, Orange	28- 3- 9	3,315	cleaning out
Fullerton Oil, No. 25 Brea, Brea Canyon, Orange	2- 3-10	3,550	pump 120 b.d.
Standard Oil, No. 69 Emery, West Coyote, Orange	24- 3-11	1,284	sd. sh. drlg.
Southwest Expl., No. 25 State, Hunt. Beach, Orange	10- 6-11	4,616	O.S. drlg.
Clear View Oil, No. 1 Williams, Hunt. Beach, Orange	36- 5-11	3,560	sd. sh. drlg.
H. R. O. Oil, No. 1 Hunt., Hunt. Beach, Orange	11- 6-11	4,782	idle
Pac. American Oil, No. 6 Book, Hunt. Beach, Orange	36- 5-11	3,873	cleaning out
South Basin Oil, No. 93 H.B., Hunt. Beach, Orange	2- 6-11	7,590	redrlg. 4,898
Hellman estate, No. 5 Hellman, Seal Beach, Orange	11- 5-12	3,383	sd. sh. drlg.
United Oil, No. 1 Schimming, Stanton, Orange	25- 4-11	4,260	sd. sh. drlg.
Thompson, M. N., No. 1 Smith, Costa Mesa, Orange	9- 6-10	5,496	idle
Bird & Chambers, No. 1 Owens, Garden Grv., Orange	31- 4-10	167	sd. sh. drlg.

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S. T. R.	Depth	Status
Union Oil, No. 4 Le Roy, Santa Maria, Santa Barb.	24-10-35	5,482	flow 500 b.d.
Union Oil, No. 18 Cal.-Coast, Santa Maria, Santa Barb.	26- 9-34	2,972	sd. sh. drlg.
Oil Group, No. 1 Hyland, Summerland, Santa Barb.	16- 4-26	2,130	sd. sh. drlg.
Levesque, G. M., No. 1 Robertson, Simi, Ventura	17- 2-18	2,340	sd. sh. drlg.
Ohio Oil, No. 1 Vail, Moor Park, Ventura	10- 2-19	5,672	sd. sh. drlg.
Sulphur Springs Oil, No. 1 Jones, Conejo, Ventura	33- 2-19	3,010	dry; abd.
Santa Clara Oil, No. 15 Cal., Shiells Can., Ventura	3- 3-19	2,940	sd. sh. drlg.
Rio Hondo Oil, No. 1 Cosby, Hopper Canyon, Ventura	14- 4-19	1,150	recmtd. 1,140
Continental Oil, No. 15 Grubb, San Miguelito, Vent.	24- 3-24	6,360	O.S drlg.
C. C. M. Oil, No. 6-B Hobson, Rincon, Ventura	17- 3-24	4,148	pump water
C. C. M. Oil, No. 31-B Hobson, Rincon, Ventura	17- 3-24	1,993	sd. sh. drlg.
C. C. M. Oil, No. 9-A Hobson, Rincon, Ventura	15- 3-24	5,760	reaming
Tide Water A. O., No. 43 V.L.W., Vent. Ave., Vent.	23- 3-23	9,886	flow 2,580 b.d.
Tide Water A. O., No. 45 V.L.W., Vent. Ave., Vent.	24- 3-23	9,190	sd. sh. drlg.
Tide Water A. O., No. 17 McGonigle, Vent. Ave., Vent.	23- 3-23	6,978	sd. sh. drlg.
Tide Water A. O., No. 119 Lloyd, Ventura Ave., Vent.	27- 3-23	7,002	sd. sh. drlg.
Tide Water A. O., No. 18 Hartman, Vent. Ave., Vent.	22- 3-23	10,885	redrlg. 10,360
Tide Water A. O., No. 22 Hartman, Vent. Ave., Vent.	22- 3-23	5,450	sd. sh. drlg.
Shell Oil, No. 113 Taylor, Ventura Ave., Ventura	29- 3-23	7,760	flow 1,592 b.d.
Shell Oil, No. 114 Taylor, Ventura Ave., Ventura	29- 3-23	6,255	O.S. drlg.
Shell Oil, No. 115 Taylor, Ventura Ave., Ventura	29- 3-23	6,861	sd. sh. drlg.
Cal. Alliance Pet., No. 2 Hartman, Vent. Ave., Vent.	22- 3-23	9,261	O.S. drlg.
Cal. Alliance Pet., No. 1 Schmidt, Vent. Ave., Vent.	21- 3-23	4,284	sd. sh. drlg.
British American Oil, No. 1 Barn, Vent. Ave., Vent.	21- 3-23	1,951	sd. sh. drlg.
Trigg, H. C., No. 1 Den, Devil's Den, Kern	11-25-18	496	idle
Franco-Western Oil, No. 17 Front, McKitt., Kern	8-30-22	2,213	pump 235 b.d.
Franco-Western Oil, No. 18 Front, McKitt., Kern	8-30-22	1,691	sd sh. drlg.
Cal. Crude Oil, No. 5 Front, McKittrick, Kern	34-30-22	997	sd. sh. drlg.
Mid-State Pet., No. 1 Welport, McKittrick, Kern	26-29-21	1,214	cleaning out
Union Oil, No. 1 Weston, Belridge, Kern	13-29-21	5,998	sd. sh. drlg.
Belridge Oil, No. 11-1 fee, North Belridge, Kern	1-28-20	8,380	flow 930 b.d.
Belridge Oil, No. 23-1 fee, North Belridge, Kern	1-28-20	7,580	br. sh. drlg.
Belridge Oil, No. 53-26 fee, North Belridge, Kern	28-27-20	8,275	flow 819 b.d.
Belridge Oil, No. 67-27 fee, North Belridge, Kern	27-27-20	8,062	will deepen
Texas Co., No. 1 Theta, Shale Hills, Kern	12-28-19	3,395	redrlg. 1,494
Bishop Oil, No. 2 Buchner, Mount Poso, Kern	20-26-28	1,526	bailing
Vedder Pet., No. 21-2 Lambert, Mount Poso, Kern	21-26-28	1,272	sd. sh. drlg.
Hearte & Tracy, No. 1 Hooper, Mount Poso, Kern	36-26-27	3,050	sd. sh. drlg.
Premier Extension Oil, No. 1 South, Jasmine, Kern	33-25-27	1,983	sd. sh. drlg.
McDonald & Dearin, No. 5 Kernco, Kern Front, Kern	11-28-27	134	sd. sh. drlg.
Davis Pet., No. 1 Kernco, Kern Front, Kern	13-28-27	1,294	pump water
Dick & Dore Oil, No. 19 Kern, Kern River, Kern	34-28-28	425	pump 3 b.d.
Dick & Dore Oil, No. 24 Kern, Kern River, Kern	34-28-28	645	O.S. drlg.
Dick & Dore Oil, No. 26 Kern, Kern River, Kern	34-28-28	178	sd. sh. drlg.
Dick & Dore Oil, No. 28 Kern, Kern River, Kern	34-28-28	607	rig to pump
Dick & Dore Oil, No. 29 Kern, Kern River, Kern	34-28-28	342	sd. sh. drlg.
Hast Oil, No. 7 Kern, Kern River, Kern	34-28-28	586	rig to pump
Helm & Smith, No. 19 Kern, Kern River, Kern	34-28-28	687	sd. sh. drlg.
Frampton, Ray, No. 1 Kernco, Kern River, Kern	12-28-27	370	sd. sh. drlg.
Shell Oil, No. 1 Brandt, Round Mountain, Kern	33-28-29	1,960	sd. sh. drlg.
Goodrum & Vincent, No. 3 S.P., Edison, Kern	31-29-30	803	will redrl.
Goodrum & Vincent, No. 4 S.P., Edison, Kern	31-29-30	381	sd. sh. drlg.
Wood-Callahan Oil, No. 1 Comm., Edison, Kern	21-30-29	4,981	cleaning out
Allied Pet., No. 35 Allied, Mountain View, Kern	19-30-29	5,287	flow 100 b.d.
Morton, L. C., No. 1 Jewett, Arvin, Kern	23-31-29	3,374	sd. sh. drlg.
Western Gulf Oil, No. 45-B, KCL, Fruitvale, Kern	22-29-27	8,960	hd. sh. drlg.
Standard Oil, No. 1-2 Tulare, Delano Gas Field, Kern	34-24-23	2,495	M.Y.A. zone

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Acd., acidized.
B.O., barrels of oil.
B.P.D., barrels per day.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
B. ck., bottom choke.
Br. sh., brown shale.
B.S., basic sediment.
C.&P., cellar and pits.
Cd. or Crd., cored.
C.D., correct depth.
Cg., coring.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg., or Drg., drilling.
Drk. or Dk., derrick.
D.S., drill stem.
D.S.T., drill-stem test.
D.P., drill pipe.
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., old well drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging back.
P.B.P., pulling or pulled big pipe.
P.L., pipe line.
P.L.O., pipe-line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulled pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Recvd., recovered.
Rmg., reaming.
Redrlg., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sdy. sh., sandy shale.
Sdtrk. or St., sidetracked.
S.D.P.L., shut down for pipe line.
S.D.O., or S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel-line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas, and water.
Spdg. or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing).
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T. ck., top choke.
T.P., tubing pressure.
Tr., tract.
Tstd., tested.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C. or W.O.C.S., waiting on cement to set.
W.O.O., waiting on orders.
W.P., working pressure.
W.S.O., water shutoff.
W.S.O.O.K., water shutoff O.K.
W.S.R. or W.O.S.R., awaiting standard rig
Wtr., water.

Trico O. & G., No. 5 M.&L., Delano Gas Field, Kern	3-25-23	2,467	will deepen
Standard Oil, No. 4 Mushrush, Wasco, Kern	7-27-24	11,697	sd. sh. drig.
Continental Oil, No. 1 Meyer, Wasco, Kern	7-27-24	13,060	hd. sh. drig.
Continental Oil, No. 1 Community, Shafter, Kern	12-28-24	12,500	sd. sh. drig.
Union Oil, No. 32-34, KCL, Rio Bravo, Kern	34-28-25	9,947	sd. sh. drig.
Union Oil, No. 54-34, KCL, Rio Bravo, Kern	34-28-25	....	rigging up
Union Oil, No. 56-27, KCL, Rio Bravo, Kern	27-28-25	11,500	flow 973 b.d.
Superior Oil, No. 3 Fink, Rio Bravo, Kern	28-28-25	10,140	sd. sh. drig.
Superior Oil, No. 2 Weber, Rio Bravo, Kern	27-28-25	7,131	sd. sh. drig.
Superior Oil, No. 3 Smith, Rio Bravo, Kern	34-28-25	11,370	O.S. drig.
Standard Oil, No. 11-23, KCL, Greeley, Kern	18-29-26	11,406	O.S. drig.
Standard Oil, No. 12-7, KCL, Greeley, Kern	7-29-26	11,510	flow 3,005 b.d.
Standard Oil, No. 12-8, KCL, Greeley, Kern	7-29-26	9,972	sd. sh. drig.
General Pet., No. 1 Oughton, Greeley, Kern	12-29-25	8,902	sd. sh. drig.
General Pet., No. 2 Sullivan, Greeley, Kern	12-29-25	8,764	sd. sh. drig.
Shell Oil, No. 63-25-B, KCL, Ten Section, Kern	29-30-26	7,581	sd. sh. drig.
Shell Oil, No. 72-30-A, KCL, Ten Section, Kern	30-30-26	8,220	flow 3,078 b.d.
Shell Oil, No. 78-30-B, KCL, Ten Section, Kern	30-30-26	2,967	sd. sh. drig.
Shell Oil, No. 34-28-B, KCL, Ten Section, Kern	28-30-26	8,220	flow 126 b.d.
Tide Water-Cont., No. 33-7-E, KCL, Strand, Kern	7-30-26	7,770	sd. sh. drig.
Shell-Ohio, No. 64-12-A, KCL, Strand, Kern	12-30-25	8,539	swabbing
Ohio Oil, No. 18-E, KCL, Canal, Kern	13-30-25	8,287	sd. sh. drig.
Richfield Oil, No. 38-28-A, KCL, Tupman, Kern	28-30-25	7,441	sd. sh. drig.
Richfield Oil, No. 74-32-A, KCL, Tupman, Kern	32-30-25	8,633	fish D.P.
Richfield Oil, No. 72-33-B, KCL, Tupman, Kern	33-30-25	9,480	P.B. 9,343
Richfield Oil, No. 78-29-A, KCL, Tupman, Kern	29-30-25	8,040	sd. sh. drig.
Richfield Oil, No. 276-29-A, KCL, Tupman, Kern	29-30-25	4,564	sd. sh. drig.
Richfield Oil, No. 12-3-C, KCL, Cole's Levee, Kern	3-31-25	9,413	cmtd., fish
Shell Oil, No. 81-17-B, KCL, Cole's Levee, Kern	17-31-25	10,449	dry; abd.
Ohio Oil, No. 8-F, KCL, Cole's Levee, Kern	11-31-25	5,536	sd. sh. drig.
Tide Water A. O., No. 72, KCL, Cole's Levee, Kern	14-31-25	10,090	hd. sh. drig.
Foster, Robert, No. 1 Hollingsworth, Md-Sun., Kern	22-32-23	1,099	gr. sd. drig.
General Pet., No. 1 B.V.A., Midway-Sunset, Kern	1-32-24	11,886	no showing
Signal Oil & Gas, No. 7 Kendon, Md.-Sun., Kern	35-32-23	2,430	hd. sd. drig.
Shell Oil, No. 45-9 B.V.A., Midway-Sunset, Kern	9-32-25	11,300	hd. sd. drig.
National Oil, No. 36 Sunset, Mdwy.-Sun., Kern	35-32-23	1,450	O.S. drig.
McDonald, Joseph, No. 19 Midway, Md.-Sun., Kern	26-31-22	1,544	O.S. drig.
Texas Co., No. 39 Midway, Midway-Sunset, Kern	32-32-24	3,195	O.S. drig.
Ohio Oil, No. 43-3-B, KCL, Paloma, Kern	3-22-26	10,361	fish D.P.
Western Gulf-Texas, No. 74-3-A, KCL, Paloma, Kern	3-32-26	11,095	hd. sh. drig.
Shell Oil, No. 52-2-13-A, KCL, San Emidio, Kern	13-11-22	13,873	dry; abd.
Oil Scout, No. 1 Tejon, Comanche Point, Kern	27-32-29	5,298	gr. sd. drig.
Richfield Oil, No. 1 Hill, Tejon Ranch, Kern	2-10-19	2,181	sd. sh. drig.
Jergins Trust, No. 1 Cheney, Panoche Creek, Fresno	29-14-13	7,581	will deepen
Texas Co., No. 1 S.P., Turk anticline, Fresno	23-17-15	9,590	no Gatchell
Tide Water A. O., No. 22 Guardian, E. Coa., Fresno	2-20-15	3,612	bailing
Standard Oil, No. 53-19-B fee, N.E. Coa., Fresno	19-19-16	6,141	sd. sh. drig.
Standard Oil, No. 68-19-B fee, N.E. Coa., Fresno	19-19-16	5,093	sd. sh. drig.
Standard Oil, No. 71-19-B fee, N.E. Coa., Fresno	19-19-16	8,255	flow 1,185 b.d.
Standard Oil, No. 82-19-B fee, N.E. Coa., Fresno	19-19-16	2,969	sd. sh. drig.
Union Oil, No. 55-18 Cook, N.E. Coa., Fresno	18-19-16	631	sd. sh. drig.
Amerada Pet., No. 1-20-B Ewing, N.E. Coa., Fresno	20-19-16	4,676	sd. sh. drig.
Texas Co., No. 5-20-B, Kimberlin, N.E. Coa., Fresno	20-19-16	3,292	sd. sh. drig.
Superior Oil, No. 4 Husong, N.E. Coa., Fresno	18-19-16	7,790	sd. sh. drig.
Pure Oil, No. 44-30-B, N.E. Coalinga, Fresno	30-19-16	6,387	sd. sh. drig.
Wilshire Oil, No. 62-30-B, N.E. Coalinga, Fresno	30-19-16	2,264	sd. sh. drig.
Lytle, R. S., Agent, No. 86-12-C, S.E. Coa., Fresno	12-20-15	6,892	flow 2,500 b.d.
Lytle, R. S., Agent, No. 51-7-F, S.E. Coa., Fresno	7-20-16	7,958	flow 1,980 b.d.
Lytle, R. S., Agent, No. 48-18-F, S.E. Coa., Fresno	18-20-16	6,351	sd. sh. drig.
Univ. Cons'd. Oil, No. 61-24-C, S.E. Coa., Fresno	24-20-15	8,063	flow 2,000 b.d
Standard Oil, No. 77-13-C fee, S.E. Coa., Fresno	13-20-15	7,790	flow 1,390 b.d.
Standard Oil, No. 22-19-F fee, S.E. Coa., Fresno	19-20-16	7,560	sd. sh. drig.
Standard Oil, No. 33-19-F fee, S.E. Coalinga, Fresno	19-20-16	6,838	br. sh. drig.
Standard Oil, No. 42-19-F fee, S.E. Coalinga, Fresno	19-20-16	7,554	cleaning out
Superior Oil, No. 2-B Cagle, S.E. Coalinga, Fresno	6-20-16	8,003	O.S. drig.
Texas Co., No. 1 Boston, Westhaven, Fresno	14-20-18	10,350	hd. sh. drig.
Union Oil, No. 9 King, Kettleman N. Dome, Fresno	29-21-17	7,360	sd. sh. drig.
K. N. D. A., No. 27-18-J, Kettleman N. Dome, Fresno	18-21-17	10,866	D.P. froze
K. N. D. A., No. 334-18-J, Kettleman N. Dome, Fresno	18-21-17	10,800	sd. sh. drig.
K. N. D. A., No. 4-16-Q, Kettleman N. Dome, Fresno	16-22-18	5,688	sd. sh. drig.
K. N. D. A., No. 34-22-Q, Kettleman N. Dome, Kings	22-22-18	7,781	sd. sh. drig.
K. N. D. A., No. 6-26-Q, Kettleman N. Dome, Kings	26-22-18	8,250	completing
K. N. D. A., No. 38-26-Q, Kettleman N. Dome, Kings	26-22-18	8,368	completing
Standard Oil, No. 72-19-J, Kettleman N. Dome, Fresno	19-21-17	10,903	redrig. 10,740
Standard Oil, No. 321-29-J, Kettl. N. Dome Fresno	29-21-17	9,003	hd. sh. drig.
Standard Oil, No. 334-29-J, Kett. N. Dome, Fresno	29-21-17	5,862	sd. sh. drig.
Standard Oil, No. 57-3-P, Kettleman N. Dome, Kings	3-22-17	8,525	O.S. drig.
Standard Oil, No. 72-17-Q, Kettleman N. Dome, Kings	17-22-18	8,690	P.B. 8,094
Standard Oil, No. 41-27-Q, Kettleman N. Dome, Kings	27-22-18	7,780	sd. sh. drig.
Standard Oil, No. 63-27-Q, Kett. N. Dome, Kings	27-22-18	7,246	sd. sh. drig.
Standard Oil, No. 72-27-Q, Kett. N. Dome, Kings	27-22-18	7,550	sd. sh. drig.
Standard Oil, No. 83-27-Q, Kettleman N. Dome, Kings	27-22-18	8,308	cleaning out
Standard Oil, No. 85-27-Q, Kettleman N. Dome, Kings	27-22-18	8,090	sd. sh. drig.
Standard Oil, No. 41-35-Q, Kettleman N. Dome, Kings	35-22-18	7,471	sd. sh. drig.
Bristol Oil, No. 1 Smith, Kettleman S. Dome, Kings	35-24-19	8,054	cmtd. 4,300
Shell Oil, No. 1 Cohn, Tulare Lake, Kings	4-22-19	10,990	hd. sh. drig.
R. W. B. Oil & Gas, No. 1 R.W.B., Alpaugh, Tulare	11-24-23	1,167	sd. sh. drig.
Holly Dev., No. 1 Meherin, Huasna, San Luis Obispo	7-32-13	2,493	sd. sh. drig.
Priest Valley Oil, No. 1 Greve, Priest Val., Monterey	22-20-12	2,210	gr. sh. drig.
Butts Oilfields, No. 6 Buttes, Marysville, Sutter	1-15 -1	7,691	testing
Richfield Oil, No. 2 Hill, Potrero, Solano	5- 4- 1	3,451	gr. sh. drig.
Tassajara Oil, No. 1 Rasmussen, Tass., Contra Costa	9- 2- 1	9,720	sd. sh. drig.

OKLAHOMA

Week Ended April 6

NORTHERN OKLAHOMA

Beckham County

Fred Coogan's No. 1 Kinchen, SE SE SE Sec. 4-9-25w. Dolo. 3,260 ft.; T.D. 3,341 ft.

Caddo County

Sinclair Prairie Oil Co.'s No. 1 Groman, SW NW NW Sec. 1-16-13w, Wlx. 9,179 ft.; sd. 10,074 ft.; drlg. 10,663 ft.

Creek County

Bryan Pet. Co.'s No. 1 Ah-Say. NE NW NE Sec. 34-14-7. Prue 2,556 ft., S.O.; T.D. 2,652 ft.; P. 40 B.O. in 24 hrs.; tstg.

Indo Oil Co.'s No. 1 Slick, NW NW NW Sec. 1-16-9. Drlg. 935 ft.

Dewey County

Magnolia Pet. Co.'s No. 1 Fiekes. C SW SW Sec. 31-18-14w. D.S.T. rec. mud at 7,718 ft.; S.D. 8,691 ft.; reprs.

Garfield County

Magnolia's No. 1 Kring, C SE SW Sec. 12-21-3w. Drlg. 5,279 ft.

Grant County

Continental Oil Co.'s No. 1 Krichmar, SE SE NE Sec. 28-28-5w. Drlg. 5,260 ft.

Hughes County

J. W. Boydston's No. 1 Robstein, C NW SE Sec. 11-6-9. S.D. 604 ft.

Hall & Jordan's No. 1-A Barker, SE SE SW Sec. 3-8-9. S.O. in sd. 2,074 ft.; T. D. 2,109 ft.; est. 2 B.O.; S.D.

Southwestern Drlg. Co.'s No. 1 Diamond, C E½ NW SE Sec. 33-9-9. Spd. 140 ft.

Walker & Johnson's No. 2 Rogers, NE NE NE Sec. 24-7-9. T.D. 598 ft.; H.F. W.; D.&A.

Kay County

Malarnee Oil Co.'s No. 1 Harris, C SW NE Sec. 14-25-1. Miss. 4,050 ft.; chat with S.O. 4,063-4,105 ft.; T.D. 4,138 ft.; C.O.

Kingfisher County

Olsen Drlg. Co.'s No. 1 Geis, C NE SW Sec. 15-18-9w; (O.W.D.D.). O.T.D. 8,507 ft.; C.O.; gas shut off.

Phillips Pet. Co.'s No. 1 Drape, C NW SE Sec. 30-18-5w. D.P. stk at 4,293 ft., T.D.

Kiowa County

Frank Dillard et al's No. 1 Hobbs, SE SE NW Sec. 35-6-17w. Set 6⅝-in. 525 ft.; T.D. 690 ft.

J. M. Henry's No. 1 Huff, SW SW NW Sec. 32-7-18w. Drlg. 1,750 ft.

Southwestern Okla. O. & G. Co.'s No. 2 Foltz, NW SE SE Sec. 10-6-18w. Drlg. below 718 ft.

Lincoln County

R. M. Purcell et al's No. 1 Wolcott, NW NW NW Sec. 2-13-4e. R.O.G.

Logan County

Helmerich & Payne's No. 1 McMahon, SW SW SE Sec. 31-17-1. Hntn. 4,983 ft.; Vla. 5,175 ft.; Wlx. 5,272 ft.; 2nd Wlx. 5,420 ft.; P.B. 5,332 ft.; av. 53 B.O.P.D.; 43.2 gr.; comp.

McIntosh County

Phillips' No. 1 Blankenship, C SW NW Sec. 33-10-13. Drlg. 3,192 ft.

Muskogee County

R. Garrett's No. 1 Escoe, SW SW SE Sec. 16-13-17. S.D. 1,665 ft.

Okfuskee County

Burke-Greis' No. 1 Dew, NE NE NE Sec. 9-12-9. R.U.S.T.

C. A. Yoakum's No. 1 Long, C SW SE Sec. 34-12-9. Rig.

C. A. Yoakum's No. 1-A Replogle-Johnson, NW NW NE Sec. 11-11-10. Drlg. 2,245 ft.

Payne County

Comoil-Haskins' No. 1 Meyer, NW SE SE Sec. 17-17-6. U.R. 10-in. 915 ft.

Helmerich & Payne's No. 1 Kramer, NW NW SE Sec. 24-17-1e. Vla. 4,931 ft.; Wlx. 5,014 ft.; cd. 5,015-20 ft.; 2nd Wlx. 5,145 ft.; T.D. 5,157 ft.; P.B. 4,855 ft.; perf.; tstg.

Texas Co.'s No. 1 Burroughs, C E½ NE NW Sec. 11-17-1. Drlg. abd. for Wlx. at 4,926 ft.

Pottawatomie County

Alma Oil Co.'s No. 1 Harrington, NW SE NW Sec. 24-9-4. Drlg. 1,710 ft.

J. W. Measel's No. 1 Billington, SE NE NE Sec. 26-9-4. Drlg. 2,640 ft.

Seminole County

Margay Oil Co.'s No. 1 Reed, NW NE NE Sec. 12-6-6. Drlg. 3,660 ft.

W. A. Mason et al's No. 1-A Reid, NW NW NE Sec. 13-9-7. N.S.; T.D. 2,284 ft.; drld. plug; 3,600,000 cu. ft. gas and S.S.O.; comp.

Tom Nix' No. 2 Warren, C E½ NE SE SE Sec. 4-6-8. S.D. 930 ft.

Stanolind O. & G. Co.'s No. 1 Aldridge, NW NE SE Sec. 32-9-8. Htn. 4,127 ft.; Vla. 4,304 ft.; 1st Wlx. 4,370 ft.; T.D. 4,394 ft.; F. 450 B.O. in 24 hrs. through tbg.; no wtr.; gr. 40.7; comp.

Washita County

Continental Oil Co.'s No. 1 School ld., C NE Sec. 16-8-16w. Gr. wsh. 3,005 ft.; drlg. 4,548 ft.

SOUTHERN OKLAHOMA

Atoka County

Brookshire et al's No. 1 Jones, C SW NW Sec. 29-3s-12. T.D. 2,045 ft.; D.&A.

Carter County

W. F. Turner's No. 1 Smith, NE SW SE Sec. 16-3s-1w. S.D. 3,640 ft.

Choctaw County

Clyde Ross et al's No. 1 Hardy, SE SE NW Sec. 21-7s-15. S.D. 1,950 ft.

Jackson County

Jones & Robinson's No. 1 Neal, SW SW SW Sec. 8-1s-20w. Rig.

Jefferson County

Fred Land et al's No. 1 Barrett, NE SE SE Sec. 14-6s-6w. Sd. 1,852 ft., S.O.; D. P. stk. at 1,100 ft.; T.D. 1,890 ft.; S.D.

Marshall County

Johnson et al's No. 1 Godfrey, SW SE NE Sec. 14-6s-6e. Vla. 2,627 ft.; S.S.O.; T.D. 4,582 ft.; W.O.C.

May Oil Corp.'s No. 1 Sacrea, SW NE SW Sec. 17-5-5. Sd. and S.G. 1,023-27 ft.; blk. sh. 1,033-37 ft.; S.D.; reprs.

Pure Oil's No. 1 Little, W½ NE SE Sec. 28-5s-7e. At 5,103 ft.; est. 30 B.O.P.H. and 3,000,000 cu. ft. gas; cd. 5,555-66 ft.; 50-ft. sd. and stain; T.D. 5,640 ft.; cmtg. 7-in. 4,857 ft.

Murray County

C. P. Williams' No. 1 fee, NE NE SE Sec. 22-1n-4. Arb. 650 ft.; S.D. 950 ft.

Stephens County

Edwin Bristow's No. 1 Damron, SE NW SW Sec. 25-2s-6w. T.D. 1,545 ft.; W.O.C.

Jackson's No. 1 Marshall, SE NE NE Sec. 1-1s-6w. Drlg. 750 ft.

KANSAS

Week Ended April 6 (Descriptions are East unless marked otherwise)

Barton County

Geo. Hinkle's No. 1 Kroutwurst, C N½ NE SE Sec. 34-16-11w. Tpka. 2,750 ft.; Lans. 3,119 ft.; Arb. 3,394 ft.; R.U.S.T. 3,401 ft.

Phillips' No. 1 Wondra, CWL SW NE Sec. 15-17-12w. Lans. 3,049 ft.; 700 ft. O.I.H., 10 hrs.; congl. 3,292 ft.; Arb. 3,316 ft.; S.O.&W. 3,318-20 ft.; H.F.W. 3,325 ft., T.D.; P.B. to 3,054 ft.; drld. cmt. to 3,090 ft.; 450 ft. O.I.H.; P. 33 B.O. in 8 hrs.

Butler County

C. E. Timm's No. 1 Kelley (O.W.D.D.), SE NW SW Sec. 20-27-4. O.T.D. 2,660 ft.; Arb. 3,024 ft.; drlg. 3,038 ft.

Cloud County

E. T. Lindsay et al's No. 1 LeBlanc, C S½ SW NW Sec. 35-6-1w. R.R.

Cowley County

Atlantic and Sinclair's No. 1 Smith, SE SE NW Sec. 33-33-4. Tpka. 1,365 ft.; drlg. 2,785 ft.

C. L. Carlock's No. 1 Starkey, CSL SE SE Sec. 21-30-7. Drlg. 1,010 ft.

Hartman & Brewer's No. 1 Falkingham, CNL NW SE Sec. 22-30-4. Drlg. 975 ft.

McKnab's No. 1 Sherwood, NE SE SW Sec. 4-35-5. Drlg. 1,227 ft.

Markey & Mission's No. 1-A Hunt, SW SW NE Sec. 16-34-5. T.D. 1,756 ft.; killed gas; U.R. 1,756 ft.

Morgan Pet. Co.'s No. 1 Dunn, CSL SW NE Sec. 2-35-5. 10-in. 40 ft.

J. W. Murfin's No. 1 Jarvis, N½ SW NE Sec. 19-31-5. Loc.

E. B. Shawver's No. 1-B Widener, C S½ SE NW Sec. 11-30-4. W.O.C. 2,710 ft.

Dickinson County

Midland Oil Co.'s No. 1 Haines, SE SW SW Sec. 23-16-4. Drlg. 250 ft.

Ellis County

Central Pet. Co.'s No. 1 Lynn, NE NE SW Sec. 14-11-18w. 10-in. 174 ft.

Dickey Oil's No. 1 Stone, N½ NE SW Sec. 4-11-17w. 15-in. 58 ft.

Ellsworth County

Lauck & Moncrief's No. 1 Ehler, CWL SW NW Sec. 35-16-10w. Lans. 2,943 ft.; Arb. 3,295-97 ft.; T.D. 3,322 ft.; P.B. 3,313 ft.; P. 303 B.O. in 8 hrs.; pot. 911 B.O.; comp.

Greenwood County

A. A. Hinze et al's No. 1 Hester, NW SW NE Sec. 1-22-12. S.D. 510 ft.

Marylyn Oil's No. 1 Burke, NE NE SW Sec. 27-24-11. Set 10-in. 685 ft.; S.D. 725 ft.; Miss. 1,875 ft., T.D.; D.&A.

C. L. Sheedy et al's No. 1 Hook, NW SW NW Sec. 4-22-10. T.D. 3,244 ft. in Miss.; S.S.O.; acd.; no test.

Jefferson County

McLaughlin Sons, Inc.'s No. 1 McLaughlin, SW NE NW Sec. 4-10-20. T.D. 1,915 ft.; whpstk. 1,858 ft.; P.B. 1,519 ft.

Leavenworth County

Wamhoff & Lebsack's No. 1 Moduska, C SE NE Sec. 36-8-20. Drlg. 120 ft.

McPherson County

Aladdin Pet. Co.'s No. 1 Bitikofer, CNL NE NW Sec. 1-20-1w. Drlg. 2,620 ft.

C. L. Carlock's No. 1 Hoyer, C SE NW Sec. 6-21-1w. Drlg. 1,690 ft.

Marshall County

Frankfort Drlg. Co.'s No. 1 Shearer, NW C Sec. 29-4-9 (O.W.D.D.). O.T.D. 822 ft.; S.O.; C.O.; S.D.O.

Marion County

Harrington & Lorieaux's No. 1 Belton SE SE NE Sec. 30-17-4. Drlg. 1,585 ft.

H. H. Royer's No. 1 Kroch, NE NE NW Sec. 28-18-4. S.D. 2,340 ft.

Reno County

Dutton et al's No. 1 Green, SE SE SE Sec. 8-23-4w. Drlg. 1,825 ft.

Rooks County

Lario O. & G. Co.'s No. 1 Morrison, C S½ SW NE Sec. 32-10-17w. 12-in. at 57 ft.

Seaney & Clampitt's No. 1 Morrison, CSL SW NE Sec. 32-10-17w. Loc.

Russell County

I. W. Murfin et al's No. 1 St. Aubyan, CSL SW SE Sec. 1-15-15w. Tpka. 2,710 ft.; Lans. 3,000 ft.; drlg. 3,077 ft.

Sedgwick County

G. A. Fuller's No. 1 Stilt, CSL SE NE Sec. 21-27-1w. S.S.O. 2,678 ft.; incr. at 2,798-2,806 ft.; load 100 B.O. and P. 250 B.O. in 33 hrs.; cmtg. 8-in. 2,792 ft.

Sunray Oil Co.'s No. 1-A McMillan, CWL NW NW Sec. 14-29-2w. Miss. 3,564 ft.; D.S.T. 3,575 ft. and rec. S.O. and mud; Arb. 4,030-55 ft., T.D.; P.B. 3,590 ft.; drld. cmt. 3,570 ft.; 240 ft. O.I.H.

Trego County

J. E. Trigg's No. 1 Rasek, C NE NE Sec. 13-12-23w. Fsg. 3,028 ft.

Woodson County

Cooper's No. 1 Sowder, SE SE NW Sec. 31-25-14. Drlg. 457 ft.

MISSOURI

Adair County

Eddington et al's No. 1-A Clark, NE NE SE Sec. 8-63-14w. Hunton 739 ft., reduced hole to 8¼ in.; drlg. ahead.

Eddington-McAlpin's No. 1 Johnson-Capps, SW SW Sec. 31-64-15w. Drlg. below 525 ft. in Miss. lime.

DeKalb County

E. H. Lawhon's No. 1 Gottschall, C SE SE Sec. 18-59-32w. Drlg. below 200 ft.

Holt County

Brin & Nathan's No. 1 Decker, C NW NW Sec. 1-61-38w. T.D. 1,030 ft.; S.D. for csg.

Macon County

Ray Dorris' No. 1 Jones, NW NW Sec. 16-58-17w. Loc.

Platte County

Roach-Vincent et al's No. 1 Dillingham, C NE SW Sec. 16-53-34w. T.D. 1,055 ft.; S.D.

Schuyler County

Rogers & Morrow's No. 1 Seamster, Sec. 6-65-13w. Running 6-in. pipe at 925 ft.

IOWA

Fremont County

Oscar Gruber's No. 1 fee, C SW SE Sec. 8-67n-40w. Drlg. below 1,300 ft.

NEBRASKA

Cass County

Golden Rod Oil Co.'s No. 1 Sparer, SE SE SE Sec. 8-11-13e. S.D. 1,205 ft., Vla. L.

Dakota County

Peder Skriver's No. 1 Armor, NE NE NE Sec. 33-28-8. T.D. 1,100 ft.; S.D.

Dawes County

G. E. Mitchell's No. 1 Palmer, NW NW SW Sec. 1-33-50w. (O.W.D.D.); O.T.D 2,964 ft.; R.U. to D.D.

Keith County

California-Nebraska Oil, Ltd.'s No. 1 Guststuehm, NW NW NW Sec. 21-14-37w. Dak. 2,772 ft.; S.O. 2,895-2,901 ft.; cd. 3,258-61 ft.; S.S.O.; S.D. 3,300 ft.

Fillmore County

Dan Kornfeld's No. 1 Mathis, NE NE NE Sec. 22-5-1w. S.D. 2,003 ft.

Pawnee County

Blaser & Hoerman's No. 1 Wilson, NE NW NW Sec. 4-1-10. S.S.O. 470-71 ft.; drlg. 476 ft.

Richardson County

Pawnee Royalty's No. 1 Boice, CSL N¼ NE NE Sec. 18-1-16e. O.T.D. 2,292 ft.; cemented off Hunton pay at 2,279-87 ft.; drlg. deeper.

Stephens & Higgins' No. 1-A Ogle, NW SE SE Sec. 9-1-14. Preparing to start.

Stephens & Uhri's No. 1 Stauffer, SW SW NE Sec. 21-1n-13e. Preparing to resume drilling at 550 ft.

Scotts Bluff County

Albert Wood et al's No. 1 McHenry, SE NE NE Sec. 33-23-57w. T.D. 625 ft.; S.D.

J. A. Fairy Pet.'s No. 1 McCulley, C SE SE Sec. 35-23-58w. S.D. 2,035 ft.

Sevier County

R. A. McArthur's No. 1 Bell est., 20 ft. SE cor. SE SW Sec. 29-9s-32w. S.D. 732 ft.

St. Francis County

D. T. Hargraves et al's No. 1 J. T. Wellford, 400 ft. N, 300 ft. W, SE cor. NE NE Sec. 29-4n-1w. R.U.

Union County—Schuler

Delta Drlg. Co.'s No. 1 J. C. Morgan, 330 ft. S and W, C Sec. 13-18-18. Set 9⅝-in. csg. 1,537 ft.; drlg. rd. sdy. sh 7,485 ft.

Union County—Other

Berg & Laney's No. 1 Cutrer, 150 ft. N, 660 ft. W, SE cor. NW SW Sec. 21-17-14. Cd. 2,727-28 ft.; rec. 7-in. por. sd.; cd. 2,728-35 ft.; rec. 7½ ft. soft por. sd., salty taste; drlg. by fish 350 ft.; T.D. 3,370 ft.; set 5½-in. csg. 2,771 ft.; perf. 2,702-05 ft.; bailed down 1,000 ft. and tstd. S.W.; recmtd. perf. 2,601-03 ft. and reperf. 2,572-74 ft.; bailed dry and drld. out cmt. 2,575 ft.

Fohs Oil Co.'s No. 1 Grace, C SE SW SE Sec. 31-17-14. Junk in hole 2,100 ft.; P.B. 800 ft.; drlg. 825 ft.; sdtrkd. hole.

Kinard Curtis et al's No. 1 J. A. Kelly, 330 ft. SW cor. SE SW SW Sec. 9-17-14. Set 10-in. csg. 203 ft.; Graves sd. 2,658-64 ft.; showed slight sat.; D.S.T. 2,651-64 ft. open 4 min. rec. est. 500,000 cu. ft. gas and 120 ft. drlg. fluid; ¼-in. B.H. ck.; B.H.P. 950 lb.; arng. set csg. 2,664 ft.

McCresslen Oil Co.'s No. 3 J. C. Parker, 250 ft. N, 400 ft. E, SW cor. Sec. 3-18-13. Drlg. 2,825 ft.

ARKANSAS

Calhoun County

British American Oil Co.'s No. 1 Freeman Smith Lbr. Co., C SE NE Sec. 17-15-13. Drlg. 3,315 ft.

Clark County

J. H. Coker and J. P. Grieves' No. 1 C. McClellan, 330 ft. NW cor. NW SE Sec. 11-20-21. Drlg. sh.&sd. 1,100 ft.

W. S. King's No. 1 N. Ross, 640 ft. S, 359 ft. W, NE cor. S½ SW Sec. 3-10-21. T.D. 2,158 ft.; S.D.

W. P. Wilson's No. 1 Hamilton & Mathews, 50 ft. W, C SE NE Sec. 31-10s-20w. O.W.W.O.; O.T.D. 1,616 ft.; drld. to 1,622 ft.; S.D.

Columbia County

Ark. Fuel Oil Co.'s No. 3-B King, 330 ft. S, 665 ft. W, NE cor. SE NW Sec. 21-17-20. Set 9⅝-in. csg. 2,190 ft.; drlg. r.&gr. sh. 6,056 ft.

Jas. Forgotson's No. 1 L. M. Dendy, C SW SW Sec. 24-17-19. Set 13⅜-in. csg. 120 ft.; set 9⅝-in. csg. 2,235 ft.; T. Bknr. 7,497 ft.; T. Smkvr. 7,568 ft.; D.S.T. 7,589-7,606 ft.; tstd. 26 thribb. sulfur wtr.; will dpn.

Hassie Hunt's No. 2 McWilliams, NE NE Sec. 16-18-19. 9⅝-in. csg. 2,109 ft.; set 5½-in. csg. 8,250 ft.; would not flw.; rkd. with gas and attempted acd: would not take acd.; drld. to 8,276 ft., tstd. S.W.; P.B.; 8,268 ft.; attempted to acd.; would not take acd.; M.I. smaller rig.

F. M. Hood's No. 1 A. C. Warren, C NE SE Sec. 9-16-22. Set 9⅝-in. csg. 2,123 ft.; drlg. r.&gr. sh. 5,460 ft.

Hunt Oil Co.'s No. 1 E. Garner, C N½ NE NE Sec. 25-17-20. and N½ NW NW Sec. 30-17-19. R.U.

McAlester Fuel Oil Co.'s No. 1 H. Sayers unit, C NE NW Sec. 15-18-22. Set 9⅝-in. csg. 4,060 ft.; drlg. rd. sdy. sh. 8,238 ft.

J. K. Mahoney's No. 3 Emma Riley, C SE SW Sec. 11-18-19. Set 16-in. csg. 138 ft.; drlg. 3,320 ft.

Mid-Continent Pet. Corp. et al's No. 1 R. S. Foster, 100 ft. N, C SE SW Sec. 24-17-20. T. main porosity 7,574 ft.; set 6-in. csg. 7,585 ft.; drlg. plug 7,595 ft.

Normandie Oil Corp.'s No. 1 D. R. Booth, C N½ NE NW and N½ NW NE Sec. 25-17-20. T. por. zone 7,600 ft.; set 7-in. csg. 7,620 ft.

Shell Oil Co., Inc.'s No. 2 R. S. Foster, C SW SW Sec. 24-17-20. D.S.T. 7,556-78 ft.; rec. 1 stand oil and dist. in 8 min.; arng. core ahd.

Standard Oil Co. of La.'s No. 1-B Gunnels et al, 560 ft. N, 660 ft. E, SW cor. NW NW Sec. 20-17-19. Drlg. sdy. sh. 6,737 ft.

Tide Water Assn. Oil Co. and Seaboard Oil Corp.'s No. 1 W. T. Beene, C NE NW Sec. 14-18-19. Set 9⅝-in. csg. 2,596 ft.; drlg. 4,470 ft.

Tide Water Assn. Oil Co. and Seaboard Oil Corp.'s No. 2 J. T. Beene, C NE NW Sec. 15-18-19. Set 13⅜-in. csg. 132 ft.; will not flow; S.I.; T. por. 8,234 ft.; T.D. 8,247 ft.; rocked with gas; would not flow; acd. with 1,000 gal.; flwd. 134 B.O. and 58 bbl. S.W. daily; 7/64-in. ck.; installing flow valves.

Tide Water Assn. Oil Co. and Seaboard Oil Corp.'s No. 1 C. H. Murphy et al, C SW NE Sec. 14-18-19. Set 9⅝-in. csg. 2,540 ft.; W.O.C.

G. H. Vaughn et al's No. 1 Mahoney, C NW NW Sec. 13-18-19. Set 9⅝-in. csg. 2,518 ft.; drlg. r.&gr. sh. 6,052 ft.

Faulkner County

Cato Oil Co., Inc.'s No. 1 R. R. Harrell, 330 ft. SE cor. SE SW Sec. 35-4n-12w. T.D. 2,438 ft.; U.R. csg. and set 7-in. csg. 2,370 ft.; bailing to test.

Lafayette County

Atlantic Ref. Co.'s No. 1 Bodcaw Lbr. Co., Sec. 29-17-23. Set 16-in. csg. 341 ft.; drlg. sh. 1,941 ft.

A. H. Boswell's No. 1 C. H. Ellis, 175 ft. NW cor. SW NE Sec. 19-16-23. R.U.

East Texas Ref. Co.'s No. 3-A Warren, C S½ NW NW Sec. 24-16-24. Set 5½-in. csg. 3,440 ft.; T.D. 3,585 ft.

Lonoke County

Lunnon Howell & Ford's No. 1 City of Cabot, C NE Lot 1, Blk. 6, Sec. 18-4n-9w. Set 4½-in. csg. 878 ft.; T.D. 900 ft.; reported S.O.; prep. test.

J. F. Russell's No. 1 J. T. Gunter, 440 ft. N, 577 ft. W, SE cor. Sec. 17-5n-10w. Drld. sd. S.S.O. 2,231-45 ft.; S.D. 2,254 ft.

Miller County

Standard Oil Co. of La.'s No. 1 W. P. Sturgis, 660 ft. S and W, C Sec. 1-17-27. Set 9⅝-in. csg. 2,497 ft.; cd. 6,035-55 ft.; rec. 18 ft.; 14 ft. fine tight sd., S.O.; drlg. 6,485 ft.

Nevada County

Velma Oil Co.'s No. 1 T. M. Bemis, 330 ft. NW cor. NW NE Sec. 23-10s-22w. Set 10-in. csg. 66 ft.; S.D. 68 ft.

Ouachita County

Liberty Oil Co.'s No. 1 P. T. Hildebrand, 660 ft. S, 330 ft. W, NE cor. SE¼ Sec. 28-15-15. O.W.W.O.; O.T.D. 4,934 ft.; reperf. csg. 2,600-25 ft.; tstd. S.W. and recmtd. perf.; arng. reperf.; set cmt. plug 2,660 ft.; ripped csg. 2,598-2,602 ft.; tstd. S.S.O.; perf. csg. 2,598-2,625 ft.; T.D. 2,680 ft.; W.O.S.R.

Pulaski County

Coker Oil Corp.'s No. 1 Huffman, 330 ft. NW cor. NW SW SW Sec. 29-4n-11w. T.D. 1,763 ft.; W.O.

Saline County

A. W. Givens' No. 1 Williams, 375 ft. S, 420 ft. E, NW cor. NE NE Sec. 18-3s-15w. S.D. sh. 494 ft.

LOUISIANA

NORTH LOUISIANA

Bossier Parish

Premier Dev. Co.'s No. 1 Mehaffey, 150 ft. S, 1,980 ft. W, NE cor. Sec. 27-19-11. Set 12½-in. csg. 155 ft.; W.O.C.

Triangle Drlg. Co.'s No. 2 Chatman, 1,977 ft. E, 1,995 ft. S, NW cor. Sec. 18-17-11. Set 5½-in. csg. 3,120 ft.; arng. test 3,130 ft.

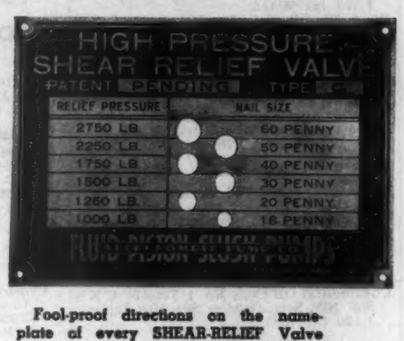
Union Prod. Co.'s No. 2-B Thigpen & Herold, 1,245 ft. S, 1,388 ft. E, NW cor. Sec. 19-17-11. Drlg. sh.&anhy. 4,014 ft.

Caddo Parish

Beaudon & Griffin's No. 1 Davidson,

INSURANCE

Against **ERROR** *in Setting the* **SHEAR-RELIEF VALVE**



Fool-proof directions on the name-plate of every SHEAR-RELIEF Valve keeps any field worker from making a mistake in resetting the valve with another nail after the valve has sheared a nail to relieve excess pump pressure. The name-plate, shown above, carries a table of nail sizes and their respective shearing stresses in pounds pressure. It also carries a nail gauge to eliminate guessing at nail sizes.

Note high pressure SHEAR-RELIEF Valve (encircled) on slush pump below . . . and close-up of valve (inset in picture).

SHEAR-RELIEF VALVE

Sec. 26-21-16. Set 8-in. csg. 915 ft.; T.D. 931 ft.

R. L. Bornitz' No. 4 Ramsey, 460 ft. N, 200 ft. E, SW cor. SE NE Sec. 32-21-15. Set 5½-in. csg. 1,379 ft.; T.D. 1,583 ft.; acd. with 3,000 gal.; W.O.S.R.

C J. Brown's No. 1 Muslow, Sec. 5-20-15. Set 7-in. csg. 1,408 ft.; acd. and tstg.; T.D. 1,565 ft.

F. W. Burford's No. 1 Wallis, 660 ft. SW cor. NW SW Sec. 5-23-15. Drlg. L.& sh. 4,268 ft.

Burnham Drlg. Co.'s No. 6 Wilkinson, Sec. 33-22-16. T.D. 2,440 ft.; prep. D. S.T.

L. M. Calhoun, Jr., Tr.'s No. 1-A Chesire, Sec. 32-21-15. R.U.

D. T. Cauble's No. 1 Darnell, Sec. 17-22-16. Set 10-in. csg. 80 ft.; T.D. 2,800 ft.; W.O.

Davidson & Brown's No. 1 Wells, Sec. 10-21-15. Set 8-in. csg. 1,597 ft.: acd. with 4,000 gal.; pmpd.; S.O. 1,789 ft.; T.D. 3,000 ft.; set 5½-in. csg.

Lloyd A. Farr's No. 5 Stiles, Sec. 17-21-16, Set 6-in. csg. 1,013 ft.; W.O.S.R.

Kendricks & Bashaw's No. 1 Huckaby-Parker, Sec. 14-22-16. T.D. 1,616 ft.; S.D.

L. & A. Oil Co.'s No. 4 Burton, Sec. 7-20-15. R.U.

Magnolia Pet. Co.'s No. 32 Dillon, Sec. 24-21-15. Set 6⅝-in. csg. 1,433 ft.; acd. and tstg.; T.D. 1,456 ft.

R. Manziel et al's No. 2 City of Shreveport, Sec. 35-18-14. Set 9-in. csg. 1,220 ft.; drlg. L.&sh. 3,347 ft.

J. S. Pate et al's No. 1 Querbes, Sec. 18-21-15. Tstd. dry; W.O. 1,660 ft.

H. Philip's (Baker & Wissman) No. 1 Muslow, Sec. 31-21-15. Set 10-in. csg. 50 ft.; drlg. sh. 450 ft.

Providence Oil Co.'s No. 6 Bostwick, Sec 13-22-16. Set 7-in. csg. 2,624 ft.; W.O.C.

R. L. Reese's No. 1 Norman, Sec. 1-20-16. Set 7-in. csg. 1,368 ft.; acd. and tstg. 1,530 ft.

Jack Terrell's No. 1 Welch, Sec. 3-20-16. Tstg. 1,540 ft.

Texas Co.'s No. 1 Caddo fee, Sec. 7-20-15. Set 6⅝-in. csg. 1,323 ft.; T.D. 1,495 ft.; W.O.C.

Texas Co.'s No. 6 Hicks-Payne, Sec. 21-21-15. Set 6⅝-in. csg. 1,504 ft.; T.D. 1,512 ft.; W.O.C.

W. & W. Oil Co.'s No. 5 Ark. Fuel, Sec. 12-20-16. Set 6⅝-in. csg. 1,390 ft.; W. O.C.

Sloan Wells' No. 1 Stiles, 3,734 ft. N 1,706 ft. E, SW cor. Sec. 32-21-16. Set 10-in. csg. 340 ft.; cor. T.D. 1,073 ft.; cst 6⅝-in. csg. 1,070 ft.; S.D.

G. Whitley's No. 1 Wall, Sec. 12-20-16. Set 10-in. csg. 40 ft.; drlg. 1,260 ft.

Ivan W. Wright's No. 1 Moore, Sec. 1-20-16. Set 10-in. csg. 40 ft.; T.D. 1,345 ft.; S.D.; will set csg.

Caldwell Parish

Arkansas Fuel Oil Co.'s No. 1 La. Cent. Lbr. Co., C NW SW Sec. 31-12-3e. O. W.D.D.; O.T.D. 7,528 ft.; taking sidewall cores 3,600 ft.

Catahoula Parish

Continental Oil Co.'s No. 1 Tensas, C N½ SW SW Sec. 12-9-7e. Set 10¾-in. csg. 1,120 ft.; W.O.C.

Claiborne Parish

L. E. Ozley's No. 1 fee, 1,220 ft. N, 300 ft. W, SE cor. Sec. 32-20-5. Drlg. hd. sh. 2,000 ft.

Tiki Expl. Co.'s No. 1 J. L. Moss, NE SE Sec. 11-22-8. Set 10¾-in. csg. 735 ft.; drlg. sd. 1,509 ft.

De Soto Parish

Dewey Juan's No. 1 Frost Lbr. Ind., 600 ft. SE cor. SW¼ Sec. 14-22-3e. T. D. 2,949 ft.; bailed down 2,300 ft.; S. S.O.; tstd. S.S.O.&S.W.; cd. to 2,938 ft. (cor.) and S.D. 3,255 ft.

Watts O. & G. Co.'s No. 1 Frank Gro. Co., 338 ft. S, 450 ft. W, NE cor. NW Sec. 35-12-11. Br. sd. 2,503-2,634 ft.; set 6-in. csg. 2,503 ft.; T.D. 2,634 ft.; W.O.C.

Grant Parish

R. D. Bevil, Jr.'s No. 1 Swope est., 150 ft. N, 270 ft. W, SE cor. NE SE Sec. 18-9n-1e. Drlg. 50 ft.

John Pundt's No. 1 Reed est., 805 ft. S, 429 ft. W, NE cor. NW SW Sec. 10-7n-3w. Set 16-in. csg. 182 ft.; T.D. 700 ft.; losing circulation.

La Salle Parish

Georgetown Oil Co.'s No. 4 Baldridge, 300 ft. S, 250 ft. E. NW cor. NE NW Sec. 11-9-1e. Set 10-in. csg. 60 ft.; T.D. 1,493 ft.; W.O.S.R.

H. L. Hunt and Ark. Fuel Oil Co.'s No. 1 Goodpine Lbr. Co., C NW NW Sec 18-10n-3e. T.D. 8,997 ft.; P.B. 4,863 ft.; set 5½-in. csg.; perf. 4,812-19 ft.; tstd. dry and perf. 4,668-84 ft.; tstd. S.S.G.; perf. 2,516-26 ft. and 2,407-15 ft. and pmpd. cmt. behind csg.; arng. perf. 2,400-ft. sd.

E. F. Neely's No. 1 Lizendy, 330 ft. NW cor. NE NE Sec. 19-10-3. Loc.

Placid Oil Co.'s No. 10 La. Cent. Lbr. Co., C NW SW Sec. 7-10n-3e. Cg. 2,350 ft.

Placid Oil Co.'s No. 11 La. Cent. Lbr. Co., C SE NE Sec. 13-10-2e. Set surf. csg.; W.O.C.

Madison Parish

Gulf Ref. Co.'s No. 1 Sondheimer, 175 ft. N, 35 ft. W, C Sec. 33-18-12e. Spd.; set 13⅜-in. csg. 169 ft.; drlg. 5,352 ft.

Natchitoches Parish

J. E. Watts' No. 1 Tanner est., 330 ft. SW cor. NW¼ Sec. 18-10-10. Set 10-in. csg. 60 ft.; W.O.C.

Sabine Parish

A. R. Chestnut's No. 1 Logan, 330 ft. SW cor. NW NW Sec. 26-10-13. Set 7-in. csg. 1,885 ft.

Odell Henson's No. 1 Frost Lbr. Ind., 660 ft. SE cor. Sec. 22-9-13. Reported S.O. 3,146-48 ft.; set 6-in. csg. 3,115 ft.; T.D. 3,148 ft.; W.O.

N. B. Livingston's No. 1 Bowman Hicks, 660 ft. SE cor. SW Sec. 36-9-14. Set 10-in. csg. 110 ft.; D.S.T. 3,125-59 ft.; ¼-in. cks. T.&B.; 35 min.; rec. 150 ft. mud and S.G.; rng. 5½-in. csg. 3,508 ft., T.D.; tstd. gas 3,462-3,535 ft.; perf. between 3,134 ft. and 3,462 ft. and tstd. est. 1,000,000 cu. ft. gas, S.O., and S.W.; P.B. 3,200 ft.; tstd. S.W.; S.O. 3,134-50 ft.; acd. with 1,500 gal.; tstd. SW and 50 B.O.; T.D. 3,170 ft.; reacd. and tstg.

J. T. Oglesby's No. 2 Sabine, 330 ft. SE cor. NW SE Sec. 5-7-13. T.D. 2,594 ft.; set 6-in. csg. 2,197 ft.

Geo. L. Pace's No. 4 Logan Oil Co., 390 ft. S, 300 ft. E, NW cor. SW Sec. 26-10-13. Crooked hole; O.T.D. 1,993 ft.; P.B.; surf. csg.; drlg. new hole 1,993 ft.

Union Parish

Memphis Nat. Gas Co.'s No. 1 Barr, Sec. 3-21-2. Set 6-in. csg. 2,150 ft.

Memphis Nat. Gas Co.'s No. 6 J. B. Lankford, 1,980 ft. S, 660 ft. W, NE cor. Sec. 3-21-3. Set 8-in. csg. 786 ft.; W.O.C.

Webster Parish

Hassie Hunt's No. 1 Cox (formerly Woodley Pet. Co.), 460 ft. N, 660 ft. E, C Sec. 22-21-10. O.W.W.O.; O.T.D. 4,676 ft.; drlg. sh.&L. 5,058 ft.

Hunt Oil Co.'s No. 1 Robt. Scott, C SE SE Sec. 19-21-9. Drlg. sh. 2,956 ft.

Hunt Oil Co.'s No. 5 Stewart, 660 ft. N. 560 ft. E, SW cor. NW¼ Sec. 29-21-10. Set 9⅝-in. csg. 5,610 ft.; T. Ctn. Vly.; T.D. sd. 8,460 ft. (oil); T. Bodcaw. sd. 8,563 ft.; drlg. hd. sd. 8,565 ft.

Midstates Oil Corp.'s No. 1 Brenner-Beamsley unit, 100 ft. SE cor. SW SE Sec. 20-21-10. Set 9⅝-in. csg. 5,617 ft.; T.D. 5,639 ft.; W.O.C.

SOUTH LOUISIANA FIELDS

Abbeville—Vermilion Parish

Continental Oil Co.'s No. 1 Boudoin, Sec. 64-12s-3e. 13⅜-in. csg. 1,776 ft.; drlg. sh. 9,100 ft.

Anse La Butte—St. Martin Parish

Glassell & Glassell's No. 2 Breaux, Sec. 118-9s-5e. T.S. 5,004 ft.; T.D. 5,047 ft.; S.D.

Glassell & Glassell's No. 1 Morest, Sec 121-9s-5e. T. salt 5,825 ft.; T.D. 5,839 ft.; run csg.

Emer Line Oil Co.'s No. 1 Nickerson, Sec. 86-9s-5e. T.D. 3,057 ft.; abd.

Bancroft—Beauregard Parish

Crosby Drlg. Co.'s No. 1 Dickerson, Sec. 15-6s-13w. T.D. 7,336 ft.; 5½-in. csg. 7,336 ft.; perf. csg. 7,326-31 ft.; I.P. 5 B.P.H.; ¼-in. ck.

Republic Prod. Co.'s No. 17 Columbia Ld. & Tmbr. Co., Sec. 16-6s-13w. Drlg. 5,830 ft.

Barataria—Jefferson Parish

California Oil Co.'s No. 1 Danciger-State, Sec. 2-16s-23e. Loc.

California Oil Co's No. 1 State-Bayou. Twp. 16-23e. 10¾-in. csg. 2,002 ft.; T.D. 8,226 ft.; W.O.C.

California Oil Co.'s No. 1 Zeringue-Community, Sec. 2-16s-23e. T.D. 8,275 ft., S.W. sd.; T. sd. 8,250 ft.; sdtrkd. 4,403 ft.; T.D. 8,329 ft.; run csg.

Carter, Perrin & Brian's No. 1 Ruttley Wiseman, Sec. 2-16s-23e. Cg. bkn. sd.& sh. S.O. 9,671 ft.

Geo. Conover's No. 1 Conover Community, Sec. 22-15s-23e. Loc.

Fohs Oil Co.'s No. 1 Conzelman, Sec. 22-15s-23e. Loc.

Bateman Lake—St. Mary Parish

Texas Co.'s No. 3 State, Sec. 16s-12e 7-in. csg. 10,970 ft.; T.D. 11,519 ft.; P.B. 10,715 ft.; perf. csg. 10,674-10,710 ft.; I.P.; gas well.

Texas Co.'s No. 3 Wax Bayou, Sec. 21-16s-12e. 7-in. csg. 10,984 ft.; T.D. 11,127 ft.; rec. 275 ft. of oil 10,879-10,900 ft.; D.S. stk.; fsg.

Baton Rouge—East Baton Rouge Parish

Guaranty Oil Co.'s No. 2 Morgan, Sec 65-7s-1w. Sdtrkd.; drlg. sh. 6,336 ft.

Wm. Helis' No. 3-C Duplantier, Sec. 70-7s-1w. T.D. 6,497 ft.; W.O.C.

Wm. Helis' No. 9 Nelson, Sec. 36-7s-1w. Loc.

Lisbon Iberia Oil Corp.'s No. 3 University Hills subd., Sec. 68-7s-1w. T.D. 6,509 ft.; 6-in. csg. 6,504 ft.

Sugarfield Oil Co.'s No. 3 McDonald, Sec. 46-7s-1e. T.D. 6,810 ft.; run csg.

Bayou Blue—Iberville Parish

T. G. Markley and Crosby Drlg. Co.'s No. 1 Baiste, Sec. 74-9s-10e. R.U.

Superior Oil Co.'s No. 2 Schwing Lbr. & Shingle Co., Sec. 74-9s-10e. T. salt 7,006 ft.; T.D. 7,011 ft., salt; 6-in. csg. 7,000 ft.; rec. S.W.; D.S.T. 6,934-65 ft. and 4,965-75 ft.; abd.

Superior Oil Co.'s No. 3 Schwing Lbr. Co., Sec. 74-9s-10e. Loc.

Bayou Choctaw—Iberville Parish

Standard Oil Co. of La.'s No. 2 Cypress, Sec. 28-8s-11e. 10¾-in. csg. 2,250 ft.; T.D. 8,609 ft.; fsg.

Bayou des Glaise—Iberville Parish

Humble O. & R. Co.'s No. 2-B Wilberta, Sec. 78-8s-8e. 10¾-in. csg. 2,854 ft.; drlg. sh. 8,567 ft.

Caillou Island—Terrebonne Parish

Texas Co.'s No. 64 State, Sec. 20-23s-20e. T.D. 5,790 ft., salt; 7-in. csg. 5,682 ft. perf. csg. 5,440-70 ft.; would not flow.

Texas Co.'s No. 65 State, Sec. 17-23s-20e. T.D. 6,280 ft.; 7-in. csg. 5,674 ft.; perf. csg. 5,885-5,905 ft.

Cameron Meadows—Cameron Parish

Magnolia Pet. Co.'s No. 27 Cameron Meadows, Sec. 21-14s-13w. T.D. 3,679 ft.; tstg.

Chacahoula—La Fourche Parish

Sun Oil Co.'s No. 2 Cypress, Sec. 75-15s-15e. Loc.

Sun Oil Co.'s No. 7 Dibert, Stark & Brown Cypress Co., Sec. 70-15s-15e. T.D. 7,400 ft.; 7-in. csg. 7,400 ft.

Chalkley Field—Cameron Parish

Humble O. & R. Co.'s No. 6 Hanzen, Sec. 9-12s-6w. T.D. 8,650 ft.; 7-in. csg. 8,646 ft.; perf. csg. 8,623-38 ft.; I.P. 373 B.P.D.; ¼-in. ck.

Humble O. & R. Co.'s No. 7 K. B. Hanzen, Sec. 9-12s-6w. Drlg. sh. 6,410 ft.

Shell Oil Co., Inc.'s No. 1 Coastal Club. T.D. 8,551 ft.; fsg.

Shell Oil Co., Inc.'s No. 7-A Hanzen, Sec. 20-12s-6w. R.U.

Shell Oil Co., Inc.'s No. 1 Sweet Lake. Drlg. sh. 8,700 ft.

Cheneyville—Rapides Parish

Amerada Pet. Corp.'s No. 8, Sec. 53-1s-2e. Drlg. sh. 5,000 ft.

S. W. Richardson's No. 1 Beasley, Sec. 55-1s-2e. Loc.

S. W. Richardson's No. 11 Well Co., Inc., Sec. 53-1s-2e. R.U.

Darrow—Ascension Parish

Humble O. & R. Co.'s No. 3-B Community, Sec. 47-10s-2e. Drlg. sh. 8,130 ft.

Humble O. & R. Co.'s No. 29 Community, Sec. 30-10s-2e. Loc.

Kiva Oil Co.'s No. 1 Duplessis, Sec. 69-10s-2w. S.D. 2,523 ft.

Dog Lake—Terrebonne Parish

Texas Co.'s No. 11 State, Sec. 32-21s-16e 10¾-in. csg. 1,751 ft.; T.D. 6,818 ft., salt; T. salt 6,807 ft.; P.B.; sdtrkd.; drlg. sh.&L. 6,526 ft.

Texas Co.'s No. 24 State, Sec. 5-22s-16e. Loc.

Edgerly—Calcasieu Parish

Emerson Oil Corp.'s No. 3 Stanolind fee Sec. 28-9s-11w. T.D. 2,818 ft.; pulled csg. to 1,600 ft.; sdtrkd.; drlg. gbo. 2,010 ft.

Eola—Avoyelles Parish

Amerada Pet. Corp.'s No. 3 Avoyelles, Sec. 5-2s-3e. Drk.

Amerada Pet. Corp.'s No. 1 Sam Cerami, Sec. 6-2s-3e. Drlg. sh.&L. 6,530 ft.

Amerada Pet. Corp.'s No. 2 Cerami, Sec. 6-2s-3e. Drlg. sh. 7,380 ft.

Amerada Pet. Corp.'s No. 3 Irion, Sec. 6-2s-3e. R.U.

Amerada Pet. Corp.'s No. 1 Knoll, Sec. 6-2s-3e. Drlg. sh.&sd. 7,720 ft.

Hany Bass & Lake's No. 1 Ritchie Grocery, Sec. 3-1s-3e. Drlg. sh.&L. 6,815 ft.

Gulf Oil Corp.'s No. 2 Mouliere, Sec. 1-2s-2e. Drlg. sh.&L. 8,240 ft.

G. R. Kenedy's No. 1 Josie Hudson, Sec. 1-2s-2e. Drlg. sh. 7,815 ft.

Magnolia Pet. Co.'s No. 1 O. Q. Foster, Sec. 6-2s-3e. Drlg. sd.&sh. 8,012 ft.

S. W. Richardson's No. 11 Haas Inv. Co., Sec. 7-2s-3e. Drlg. sh. 7,510 ft.

Fausse Point—Iberia Parish

Sun Oil Co.'s No. 1 Planters Lbr. Co., Sec. 27-11s-8e. 10¾-in. csg. 1,424 ft.; T.D. 4,711 ft.

Texas Co.'s No. 7 State, Sec. 35-11s-8e. Drlg. sh. 5,073 ft.

Garden Island—Plaquemines Parish

Texas Co.'s No. 42 State, Sec. 38-23s-33e. T.D. 5,749 ft.; 7-in. csg. 5,482 ft.

Texas Co.'s No. 43 State, Sec. 38-23s-33e Drlg. sdy. sh. 4,751 ft.

Gibson—Terrebonne Parish

Shell Oil Co., Inc.'s No. 8 Pelican, Sec. 35-17s-15e. Cg. sh. 9,618 ft.

Gillis—Calcasieu Parish

Fohs Oil Co.'s No. 2-A M. P. Erwin, Sec. 14-9s-8w. T.D. 6,309 ft.; sdtrkd.; drlg. sh. 5,200 ft.

Golden Meadow—La Fourche Parish

Bateman Drlg. Co.'s No. 1 Harry Louviere, Sec. 9-19s-22e. T.D. 5,560 ft.; 5½-in. csg. 5,260 ft.; perf. csg. 5,150-80 ft.; S.D.

Bennett O. & R. Co.'s No. 3 Authement, Sec. 12-19s-22e. Drlg. sh. 6,148 ft.

Bennett O. & R. Co.'s No. 1 Guilbeau, Sec. 2-19s-22e. Loc.

Bennett O. & R. Co.'s No. 2 Leo Lafont, Sec. 2-19s-22e. T.D. 2,671 ft.; run csg.

Bennett O. & R. Co.'s No. 3 Lafont, Sec. 2-19s-22e. T.D. 74 ft.; W.O.C.

Bennett O. & R. Co.'s No. 1 Noel Cochenee, Sec. 2-19s-22e. S.D. 121 ft.

Berkshire Oil Co.'s No. 4 Malgom, Sec. 2-19s-22e. T.D. 2,679 ft.; 5½-in. csg. 2,679 ft.

Berkshire Oil Co.'s No. 14 Nicol, Sec. 9-19s-22e. T.D. 5,175 ft.; 5½-in. csg. 5,170 ft.

Brown & Woods' No. 1 Guilbeau, Sec. 2-19s-22e. R.U.

Brown & Woods' No. 1 S. Hogan, Sec. 9-19s-22e. T.D. 2,710 ft.; P.B. to 1,500 ft.; sdtrkd.; T.D. 2,672 ft.; 7-in. csg. on bttm.; perf. csg. 2,650-65 ft.; would not flow; S.D.; T.A.

M. H. Marr et al's No. 2 B. & D. unit, Sec. 17-19s-22e. Bldg. rd.

Martex Oil Corp.'s No. 1-D Rebstock, Sec. 2-19s-22e. 10¾-in. csg. 723 ft.

Martex Oil Co.'s No. 3-A Rebstock, Sec. 2-19s-22e. T.D. 2,665 ft.; 5-in. csg. 2,665 ft.; perf. csg. 2,630-62 ft.; tstg.

Martex Oil Corp.'s No. 4-A Rebstock, Sec. 2-19s-22e. T.D. 5,210 ft.; 7-in. csg. 5,210 ft.; perf. csg. 5,168-79 ft.; I.P. 287 B.P.D.; 11/64-in. ck.

Geo. O'Dwyer et al's No. 1 La Fourche, Sec. 21-19s-22e. R.U.

Terouche Oil Co.'s No. 2 Cheramie, Sec. 12-19s-22e. Drk.

Texas Co.'s No. 12 Falgout Holding Co., Sec. 9-19s-22e. Drlg. sdy. sh. 3,574 ft.

Texas Co.'s No. 10 Golden Meadow, Sec. 78-19s-21e. 10¾-in. csg. 765 ft.; T.D. 5,345 ft.; 7-in. csg. 5,280 ft.; perf. csg. 5,076-86 ft.; I.P. 255 B.P.D.; 10/64-in. ck.

Texas Co.'s No. 12 Golden Meadow, Sec. 78-19s-21e. Loc.

Texas Co.'s No. 5 La Terre, Sec. 2-20s-21e. Loc.

Texas Co.'s No. 6 Le Terre, Sec. 1-20s-21e. Loc.

Texas Co.'s No. 7 State-Catfish, Sec. 2-20s-21e. Loc.

Grand Bay—Plaquemines Parish

Gulf Oil Corp.'s No. 7-A Grand Prairie Lv. Dist., Sec. 5-20s-19e. Loc.

Gulf Oil Corp.'s No. 8-A Grand Prairie Dist., Sec. 5-20s-19e. Loc.

Gulf Oil Corp.'s No. 4 State QQ, Sec. 5-20s-19e. Drlg. bkn. sd.&sh. 8,770 ft.

Gulf Oil Corp.'s No. 4 State, Sec. 20-19s-19e. Drlg. sh.&L. 8,450 ft.

Gulf Oil Corp.'s No. 5 State QQ, Sec. 31-19s-19e. Loc.

Texas Co.'s No. 1 State-Lookout Pass, Sec. 48-20s-18e. Drlg. sh. 8,175 ft.

Texas Co.'s No. 3 State-Lookout Pass, Sec. 6-20s-19e. Loc.

Gulf Oil Corp.'s No. 1 State QQ, Sec. 6-20s-19e. Drlg. sdy. sh. 9,924 ft.

Grand Lake—Cameron Parish

Amerada Pet. Corp.'s No. 4 State, Twp. 13s-4w. Drlg. sh. 7,100 ft.

Superior Oil Co.'s No. 9 State, Twp. 13s-4w. T.D. 8,986 ft.

Hackberry—Cameron Parish

Hanson & Abercrombie's No. 2 Verdin, Sec. 36-12s-10w. M.I.M.

Harrison & Abercrombie's No. 1 Doiron, Sec. 37-12s-10w. 10¾-in. csg. 1,441 ft.; T.D. 7,325 ft.; I.P. 722 B.P.D.; 12/64-in. ck.

Stanolind O. & G. Co.'s No. 21-A Cameron Sch. Bd., Sec. 16-12s-10w. T.D. 9,337 ft.; 7-in. csg. on bttm.; perf. csg. 9,290-9,315 ft.; I.P. 527 B.P.D.; 7/32-in. ck.

Stanolind O. & G. Co.'s No. 31 Gulf Ld., Sec. 25-12s-11w. R.U.

Superior Oil Co.'s No. 9 Benson Vincent, Sec. 30-12s-10w. 9⅝-in. csg. 950 ft.; T.D. 8,420 ft.

Texas Co.'s No. 29-B State, Twp. 12s-9w. T.D. 8,470 ft.; 7-in. csg. 7,032 ft.; P.B. 6,884 ft.; tstd. S.W.; made sqze. job; drlg. out cmt.

Happytown—Iberville Parish

Shell Oil Co., Inc.'s No. 1 Schwing Lbr. & Shingle Co., Sec. 85-7s-8e. Drlg. sh. &L. 9,252 ft.

Horseshoe Bayou—St. Mary Parish

Texas Co.'s No. 4 State, Sec. 23-17s-9e. Drlg. 2,730 ft.

Jeanerette—St. Mary Parish

Herton Oil Co.'s No. 10 Banta, Sec. 40-13s-9e. Loc.

Jefferson Island—Iberia Parish

Texas Co.'s No. 4 Jefferson Island Salt, Sec. 58-12s-5e. 7⅝-in. csg. 8,494 ft.; T.D. 8,646 ft.; P.B. 8,100 ft.; perf. csg. 8,012-32 ft.; I.P. 128 B.P.D.; 36.8-gr. oil per day; 10/64-in. ck.

Texas Co.'s No. 3 State, Twp. 12s-5e. T.D. 7,749 ft.; fsg.

Jennings—Acadia Parish

Glassell-Glassell's No. 8 McFarlain, Sec. 41-9s-2w. Drk.

Gulf Oil Corp.'s No. 42 Arnaudet, Sec. 47-9s-2w. 7-in. csg. 7,961 ft.; T.D. 7,983 ft.; sdtrkd.; drlg. sd.&L. 7,974 ft.

Shell Oil Co., Inc.'s No. 10 Community, Sec. 40. Cg. 7,078 ft.

Stanolind O. & G. Co.'s No. 117 Crowley O. & Min. Co., Sec. 48-9s-2w. Drlg. sdy. sh. 6,478 ft.

Stricker-Pharis et al's No. 1 Gulf fee, Sec. 45-9s-2w. 16-in. csg. 60 ft.; S.D. 7,503 ft.

Lafitte—Jefferson Parish

Texas Co.'s No. 15 Lafitte, Sec. 20-17s-24e. T.D. 10,135 ft.; 7-in. csg. 10,123 ft.; perf. csg. 9,475-9,505 ft.; rec. S.W.; perf. csg. 6,515-35 ft.; tstg.

Texas Co.'s No. 16 L.L.&E., Lafitte, Sec. 17-17s-24e. Loc.

Texas Co.'s No. 6-A Madison Realty Co., Sec. 17-17s-24e. Dredge canal.

Texas Co.'s No. 13 Rigolet Cooperative Fur Co., Sec. 29-17s-24e. Drlg. sh. 9,543 ft.

Texas Co.'s No. 3 State, Bayou Norman, Sec. 21-17s-24e. T.D. 10,139 ft.; 7-in. csg. 10,139 ft.; perf. csg. 9,795-9,810 ft.; I.P. 473 B.P.D.; ¼-in. ck.

La Fourche Crossing—La Fourche Parish

Lisbon-Iberia Oil Co.'s No. 1 Prosper

Thibodaux, Sec. 17-15s-17e. Drlg. sh. 1,820 ft.
Mikton Oil Co.'s No. 2 Martinez, Sec. 132-15s-17e. 11¾-in. csg. 2,687 ft.; T.D. 4,904 ft.; P.B. 4,700 ft.; T.D. 10,998 ft.; 5½-in. csg. 10,042 ft.; perf. csg. 10,036-38 ft.; rec. dist.; sqzd. perf.; W. O.C.

Lake Mongoulois—St. Martin Parish

Texas Co.'s No. 8 State, Sec. 10-10s-9e. Drk.

Lake Pelto—Terrebonne Parish

Texas Co.'s No. 30 Lake Pelto, Sec. 7-23s-18e. Cg. cap rk. 4,698 ft.
Texas Co.'s No. 31 State, Sec. 8-23s-18e. Loc.

La Place—St. James Parish

Pan American Prod. Co.'s No. 1 Godchaux Sugars, Sec. 97-11s-7e. 10¾-in. csg. 2,814 ft.; cg. sh. 8,860 ft.

Leeville—La Fourche Parish

Texas Co.'s No. 73 Leeville, Sec. 27-21s-22e. Loc.

New Iberia—Iberia Parish

Acadian Prod. Co.'s No. 4 E. T. Weeks, Sec. 51-12s-7e. Loc.
Canal Oil Co.'s No. 3 Bernard, Sec. 54-12s-7e. T.D. 4,653 ft.; 7-in. csg. 4,436 ft.; perf. csg. 3,178-90 ft.; I.P. 113 bbl., 12 hrs.; pmpg.
Wm. Helis' No. 12 Bolivar, Sec. 56-12s-7e. T.D. 1,204 ft.; 7-in. csg. 1,002 ft.; W.O.S.R.; I.P. 13 B.P.D.; pmpg.
Wm. Helis' No. 1-A Bullock, Sec. 25-12s-7e. Cg. 5,125 ft.
Wm. Helis' No. 9 Schwing, Sec. 56-12s-7e. T.D. 855 ft.; 7-in. csg. 825 ft.; abd.
Wm. Helis' No. 10 Schwing, Sec. 56-12s-7e. Drlg. sh. 7,619 ft.
Texas Co.'s No. 2 Bryant, Sec. 25-12s-7e R.U.
Texas Co.'s No. 7 Bryant, Sec. 25-12s-7e Drk.
Texas Co.'s No. 17 Duhe, Sec. 26-12s-7e. Drlg. sh. 2,920 ft.
Texas Co.'s No. 2 Hebert, Sec. 25-12s-7e. T.D. 1,935 ft.; 10¾-in. csg. 1,935 ft.; T. salt 8,520 ft.
Texas Co.'s No. 1 H. Perry Walet, Sec. 2-12s-7e. T.D. 9,116 ft.; 7-in. csg. 8,838 ft.; perf. csg. 7,888-7,900 ft.; I.P. 29 B.P.D.; pmpg.
Texas Co.'s No. 2 Smith, Sec. 71-12s-7e Drlg. sh.&L. 9,112 ft.

North Crowley—Acadia Parish

Humble O. & R. Co.'s No. 8 Ohlenforst, Sec. 34-8s-1e. Drlg. sh.&sd. 8,764 ft.
Humble O. & R. Co.'s No. 5 Staken, Sec. 33-8s-1e. Drk.

North Elton—Calcasieu Parish

W. T. Burton's No. 1 Calcasieu Natl. Bnk., Sec. 23-6s-3w. Loc.

Paradis—St. Charles Parish

Jolly Pet. Co.'s No. 1 Matthews Oliveira, Sec. 4-14s-20e. Cg. 9,920 ft.
Texas Co.'s No. 3 L.L.&E., Paradis, Sec 8-14s-20e. 10¾-in. csg. 1,448 ft.; 7-in. csg. on bttm.; cd. O.S. 10,188-10,256 ft.; T.D. 11,555 ft.; P.B. 11,220 ft.; perf. csg. 10,187-10,212 ft.; I.P. 958 B.P.D.; ¾-in. ck.; T.P. 1,750 lb.
Texas Co.'s No. 4 L.L.&E. Paradis, Sec. 6-14s-20e. R.U.
Texas Co.'s No. 1 Sunset Realty & Planting Co., Sec. 38-14s-20e. Drk.

Plumb Bob—St. Martin Parish

Texas Co.'s No. 13 St. Martin Ld. Co., Sec. 21-8s-7e. Drlg. sd. 7,715 ft.

Port Barre—St. Landry Parish

McDannald Oil Co.'s No. 1 Sibille, Sec. 7-6s-6e. Drlg. sh. 4,880 ft.
McDannald Oil Co.'s No. 2 Sibille, Sec. 7-6s-6e. Loc.
Y. D. Spill's No. 1 Gaudet, Sec. 4-6s-5e. S.D. 4,700 ft.
Texas Co.'s No. 27 Botney Bay, Sec. 4-6s-5e. 7-in. csg. 6,236 ft.; T.D. 6,523 ft. perf. csg. 6,053-93 ft.; I.P. 320 B.P.D.; 12/64-in. ck.
Westgate-Greenland Oil Co.'s No. 1 Jeansenne, Sec. 20-6s-5e. 7-in. csg. 5,286 ft.; perf. csg.; T.D. 5,314 ft.; S.D.

Potash—Plaquemines Parish

Humble O. & R. Co.'s No. 42 Orleans Lv. dist., Sec. 14-18s-15e. T.D. 7,954 ft.; T.S. 7,934 ft.; 7-in. csg. 7,927 ft.; I.P. 384 B.P.D.; ¼-in. ck.

Quarantine Bay—Plaquemines Parish

Gulf Oil Corp.'s No. 6-A Orleans Lv. Bd., Sec. 7-19s-17e. Driving piling.
Gulf Oil Corp.'s No. 12 State, Sec. 18-19s-17e. T.D. 8,562 ft.; 7-in. csg. 8,525 ft.
Gulf Oil Corp.'s No. 16 State, Sec. 7-19s-17e. 13⅜-in. csg. 1,598 ft.; drlg. sdy sh. 8,556 ft.
Gulf Ref. Co.'s No. 17 State, Twp. 19s-17e. Loc.
Gulf Ref. Co.'s No. 18 State, Twp. 19s-17e. Loc.

Raceland—La Fourche Parish

Amerada Pet. Corp.'s No. 5 South Coast Corp., Sec. 34-15s-19e. Drlg. sh.&shls. 8,174 ft.

Sorrento—Ascension Parish

Sorrento Synd.'s No. 2 L. L. Bernard, Sec. 22-10s-4e. R.U.

South Jennings—Jeff Davis Parish

W. H. Collins' No. 1 Richard, Sec. 22-10s-3w. Drk.
Stanolind O. & G. Co.'s No. 1 Clare E. Landry and A. A. Hebert. T.D. 9,638 ft.; 5½-in. csg. 9,487 ft.; perf. csg. 8,895-8,905 ft.; fsg. for tbg.
Stanolind O. & G. Co.'s No. 1 Morgan, Sec. 15-10s-3w. T.D. 9,575 ft.; 5½-in. csg. 9,178 ft.
Stanolind O. & G. Co.'s No. 1 L. Remage, Sec. 9-10s-3w. Drlg. sh.&L. 9,830 ft.

South Roanoke—Jeff Davis Parish

Continental Oil Co.'s No. 4 Sturdevant, Sec. 35-10s-4w. Drlg. sh. 2,804 ft.

Starks—Calcasieu Parish

W. T. Burton & McLean's No. 2 Industrial Lbr. Co., Sec. 29-9s-12w. Drlg. sh. 2,500 ft.
W. T. Burton Oil Co.'s No. 1 Lutcher Moore Lbr. Co., Sec. 30-9s-12w. Drk.

Sweet Lake—Cameron Parish

Pure Oil Co.'s No. 16 Stanolind O. & G. Co., Sec. 12-13s-8w. Drk.

Valentine—La Fourche Parish

Wm. Helis' No. 6 Valentine Sugars, Inc Sec. 2-17s-20e. T.D. 7,405 ft.; run 7-in. csg.

Venice—Plaquemines Parish

Tide Water Asso. Oil Co.'s No. 7 Buras Lv. Bd., Sec. 22-21s-30e. 16-in. csg. 205 ft.; T.D. 10,765 ft.

Vermilion Bay—Iberia Parish

Texas Co.'s No. 4-B Vermilion Bay, Twp. 16s-15e. 11¾-in. csg. 4,454 ft.; T. salt 5,855 ft.; base salt 7,435 ft.; stk. csg.; pulling.

Villa Platte—Evangeline Parish

Amerada Pet. Corp.'s No. 1 Leona O Roberie, Sec. 1-4s-2e. Cg. sh.&sd. 10,000 ft.
Continental Oil Co.'s No. 3 Corell, Sec. 36-3s-2e. Drlg. sh. 9,276 ft.
Continental Oil Co.'s No. 6 Deville, Sec. 3-4s-2e. R.U.
Continental Oil Co.'s No. 6 Haas, Sec. 44-3s-2e. Drlg. 2,310 ft.
Continental Oil Co.'s No. 3 La Central, Sec. 46-3s-2e. Drlg. sh. 2,116 ft.
Continental Oil Co.'s No. 1 Opelousas, St. Landry, Sec. 44-3s-2e. Drlg. sh. 1,518 ft.
Continental Oil Co.'s No. 1 Adam Tate, Sec. 41-4s-2e. Drlg. sh. 9,520 ft.
Continental Oil Co.'s No. 1 J. E. Vidrine, Sec. 1-4s-2e. Drlg. sh. 8,578 ft.
Danciger O. & R. Co.'s No. 2 J. E. Vidrine, Sec. 1-4s-2e. Drlg. sh. 8,467 ft.
J. K. Hughes' No. 2 Ortego, Sec. 36-3s-2e. Loc.

West Cote Blanche—St. Mary Parish

Texas Co.'s No. 2 State, West Cote Blanche, Twp. 16s-6e. Loc.
Texas Co.'s No. 3 State, West Cote Blanche, Twp. 16s-6e. Loc.

West Gueydan—Vermilion Parish

Magnolia Pet. Co.'s No. 1 J. Hartwell, Sec. 5-12s-2w. Drlg. sd.&L. 7,980 ft.

West Lake Verret—St. Mary Parish

Shell Oil Co., Inc.'s No. 4 Jeanerette, 7⅝-in. csg. 10,683 ft.; T.D. 11,890 ft.; P.B. 11,371 ft.; flwg. into tanks; no ga.; perf. csg. 11,348-53 ft.; prep. to sqze. perf

White Castle—Iberville Parish

Jolly Pet. Corp.'s No. 1 E. B. Adams, Sec. 1-11s-12e. S.D. 6,655 ft.
Shell Oil Co., Inc.'s No. 16 Wilbert, Sec 8-11s-12e. Loc.

Woodlawn—Jeff Davis Parish

Union Sulphur Co.'s No. 2 Johnson, Sec. 12-9s-6w. R.U.
Union Sulphur Co.'s No. 1 T. Miller, Sec. 6-9s-5w. Loc.

S. LOUISIANA WILDCATS

Acadia Parish

Continental Oil Co.'s No. 1 W. B. Vincent, Sec. 26-7s-2w. R.U.
Humble O. & R. Co.'s No. 1 Leger, Sec 83-8s-2e. Drlg. sh. 7,310 ft.
Vincent, Welch & E. J. Nickles' No. 1 L. Ruppert, Sec. 21-7s-1w. Perf. csg. 3,505-15 ft.; rec. mud; S.S.O.

Assumption Parish

Falcon-Seaboard Drlg. Co.'s No. 1 Alex Simoneaux, Sec. 43-12s-13e. 18⅝-in. csg. 60 ft.; T.D. 4,838 ft.; fsg.

Beauregard Parish

Atlantic Ref. Co.'s No. 1 Lutcher Moore, Sec. 22-3s-11w. Loc.
Atlantic Ref. Co.'s No. 1 Rice Ld. & Lbr. Co., Sec. 22-3s-11w. Loc.
Loffland Bros.' No. 3 Long Bell Lbr. Co., Sec. 24-5s-11w. Drlg. sh. 7,626 ft.

Calcasieu Parish

Edson Pet. Co.'s No. 1 Edgwood Ld. & Logging Co., Sec. 33-7s-10w. T.D. 7,515 ft.; abd.

Cameron Parish

Phillips Pet. Co.'s No. 1 Miami Corp., Sec. 11-4s-6w. T.D. 10,195 ft.; well tried to blow out; stk. D.S.; sdtrkd. 3,775 ft.; T.D. 5,378 ft.; sdtrkd.; drlg. sh. 8,026 ft.

East Baton Rouge Parish

Farris & Golding Drlg. Co.'s No. 1 Paulet, Sec. 58-8s-1e. 10¾-in. csg. 1,780 ft.

Iberville Parish

Shell Oil Co., Inc.'s No. 1 Southwood, Sec. 20-9s-2e. Drlg. sh.&L. 7,650 ft.

Jeff Davis Parish

Continental Oil Co.'s No. 1 Niblett, Sec. 1-11s-5w. 13⅜-in. csg. 2,085 ft.; 7-in. csg. 10,955 ft.; T.D. 11,748 ft.; 5½-in. csg. 11,747 ft.; perf. csg. 11,604-24 ft.; I.P. 100 B.P.D.; various cks.
H. M. Naylor's No. 1 Acadia Dev. Co., Sec. 12-10s-2w. T.D. 2,190 ft.; 10¾-in. csg. 2,115 ft.; drlg. sh. 7,126 ft.
Union Sulphur Co.'s No. 1 Somson, Sec. 35-7s-4w. Drlg. sh. 8,610 ft.

Jefferson Parish

Vendome Pet. Co.'s No. 1 Coulon, Sec. 15-15s-23e. Drk.

La Fourche Parish

Ernest Cockrell's No. 1 La Fourche Ld. Co., Sec. 32-18s-22e. 10¾-in. csg. 650 ft.; drlg. sh. 1,720 ft.
Gulf Oil Corp.'s No. 1-B Bowie Lbr. Co., Sec. 69-15s-19e. T.D. 8,230 ft.; run 9⅝-in. csg.
Humble O. & R. Co.'s No. 1 Caldwell Sugars, Inc., Sec. 115-14s-15e. 13⅜-in. csg. 2,988 ft.; T.D. 10,875 ft.; fsg.

Livingston Parish

Roderick Tower, Inc.'s No. 1 James Pirie, Sec. 41-7s-3e. Drlg. 8,536 ft.

Orleans Parish

W. T. Burton's No. 1 L.&N.R.R., Sec. 18 11s-15e. T.D. 10,405 ft.; P.B. 10,150 ft. perf. csg. 9,010-18 ft.; rec. S.W.; abd.

Plaquemines Parish

Gulf Oil Corp.'s No. 1-E Buras Lv. dist., Sec. 1-23s-10e. Dredge canal.
California Co.'s No. 1 Delta Minerals, Sec. 2-15s-24e, 13⅜-in. csg. 2,028 ft.; T.D. 10,254 ft.

Rapides Parish

Gulf States' No. 1 Long Bell Lbr. Co., Sec. 46-4n-3w. Drk.

St. Bernard Parish

Gulf Ref. Co.'s No. 4 State-R.R. (Lake Borgne), Twp. 12s-15e. 9⅝-in. csg. 8,161 ft.; drlg. sh. 12,036 ft.

St. Charles Parish

R. H. Parker et al's No. 1 C. L. Thompson, Sec. 87-13s-20e, 10¾-in. csg. 2,599 ft.; cg. 10,167 ft.

St. James Parish

St. James Oil Co.'s No. 1 Celstine Plant, Sec. 74-11s-4e. R.U.

St. Mary Parish

Joe Domingue's No. 1 Allain, Sec. 46-13s-9e. S.D. 1,510 ft.

Terrebonne Parish

Barnsdall Oil Co.'s No. 1 Nelson, Sec. 2-21s-11e. 10¾-in. csg. 2,767 ft.; 8⅝-in. csg. 10,505 ft.; cg. 11,256 ft.
Texas Co.'s No. 4 State, Coon Point, in Lake Caillou, Twp. 23s-14e. Drlg. sh. 9,212 ft.

Vermilion Parish

La. Ld. & Expltn. Co.'s No. 1 Walter White hrs., Sec. 17-15s-1e. 13⅜-in. csg. 2,800 ft.; drlg. sh. 4,410 ft.
Texas Co.'s No. 1 Vermilion Par. Sch. Bd., Sec. 16-13s-4e. T.D. 9,923 ft.; 7⅝-in. csg. 9,918 ft.; T.D. 10,595 ft.; P.B. 10,250 ft.; sdtrkd. 10,300 ft.; cd. S.W. sd. 10,659-79 ft.; T.D. 11,762 ft.; perf. csg. 11,378-88 ft.; I.P. 300 B.O.P.D.; 12/64-in. ck.; W.P. 300 lb.
G. H. Vaughn's No. 1 Avery Boullion, Sec. 49-13s-4e. Drlg. 9,902 ft.

TEXAS

Week Ended April 6

GULF COAST FIELDS

Anchor—Brazoria County

Humble O. & R. Co.'s No. 1 R. H. Carr, Blk. 62, 9⅝-in. csg. 6,950 ft.; T.D. 10,791 ft.; 7-in. csg. 10,762 ft.; perf. csg. 10,481-86 ft.; swbg.
Humble O. & R. Co.'s No. 1 Crockett, J. de Jesus Valderas Sur. 13⅜-in. csg.; T.D. 10,617 ft.; 5½-in. csg. 10,617 ft.; perf. csg. 9,626-28 ft.; tstg.
Humble O. & R. Co.'s No. 1 Galanick & Taylor, J. de Jesus Valderas Sur. 9⅝-in. csg. 6,953 ft.; T.D. 10,994 ft.; 7-in. csg. 10,822 ft.; perf. csg. 10,480-83 ft.; I.P. 3 bbl. dist. per hr.; ¼-in. ck.
Humble O. & R. Co.'s No. 1 Heim & Holland, S. Marsh Sur. Loc.
Glenn McCarthy's No. 1 Neidringhaus, J. Bradley Sur. 13⅜-in. csg. 926 ft.; drlg. sh. 10,807 ft.
Glenn McCarthy's No. 1 Kate and Laura Yocum, J. D. Valderas Sur. Drlg. sh. 9,615 ft.
Sun Oil Co.'s No. 1 Morris Stern, Shubal Marsh Sur. 18⅝-in. csg. 128 ft.; drlg. sh. 8,856 ft.

Old Ocean—Brazoria County

Harrison & Abercrombie's No. 8 Armstrong, Polly & Chance Sur. Drlg. sd. &sh. 10,945 ft.
Harrison & Abercrombie's No. 7 Bernard River Ld. Dev. Co., C. Breen Sur. T.D. 10,525 ft.; tstg.
Harrison & Abercrombie's No. 1 A. F. Wilson, D. McCormick Sur. Drlg. sd.& L. 5,020 ft.
Stanolind O. & G. Co.'s No. 2 Giles, C. Breen Sur. Drlg. 2,212 ft.
Stanolind O. & G. Co.'s No. 1 Hughes, C. Breen Sur. Drlg. sh.&L. 9,200 ft.
Sun Oil Co.'s No. 4 Borsodi, C. Breen Sur. 13⅜-in. csg. 1,520 ft.; 9⅝-in. csg. 7,009 ft.; drlg. 9,212 ft.
Sun Oil Co.'s No. 5 McCampbell, C. Breen Sur. Drlg. sh.&L. 2,410 ft.

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Tulsa, Oklahoma

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Seabreeze—Chambers County

Sun Oil Co.'s No. 1 Felix Jackson, A. Y. Barbo Sur. 10¾-in. csg. 1,943 ft.; drlg. sh. 5,810 ft.

Sun Oil Co.'s No. 1 Samuelson & Whitney, T.&N.O. Sur. 131. Cored sd., oil odor 8,417-18 ft. and 8,422-23 ft.; T.D. 8,469 ft.; 7-in. csg. 8,469 ft.; perf. csg. 8,300-25 ft.; flwg. dry gas; comp. for gas well.

Rosenberg—Fort Bend County

Humble O. & R. Co.'s No. 1 R. Kroesche, H.&T.C. Sur. Drlg. sh. 5,967 ft.

Caplen—Galveston County

Sun Oil Co.'s No. 2-26 State, S. F. Hughes Sur. Drlg. sh.&L. 4,812 ft.

Sun Oil Co.'s No. 4 Zinn & Forman, C. A. Hughes Sur. Drlg. sh.&L. 4,020 ft.

League City—Galveston County

Phillips Pet. Co.'s No. 7 Lobit, Perry & Austin Sur. Drlg. sh. 9,012 ft.

Phillips Pet. Co.'s No. 4 Stewart Title Guaranty Co., S. F. Austin Sur. 10¾-in. csg. 3,520 ft.; 7⅝-in. csg. 9,510 ft.; T.D. 11,270 ft.; well blew out; killed; fsg.

Clear Lake—Harris County

Humble O. & R. Co.'s No. 37-C West, G. B. McKinstry Sur. Drlg. L. 4,510 ft.

Humble O. & R. Co.'s No. 38-C West, G. B. McKinstry Sur. T.D. 5,908 ft.; tstg.

Stanolind O. & G. Co.'s No. 3 Sowden, J. Lindsey Sur. Drlg. sh. 4,212 ft.

Friendswood—Harris County

Humble O. & R. Co.'s No. 1-C H. Godwin, W. K. Smith Sur. Drlg. 1,500 ft.

Humble O. & R. Co.'s No. 2 Pendarvis, T. Choate Sur. T.D. 6,105 ft.; W.O.C.

Fannett—Jefferson County

Gulf Oil Corp.'s No. 4 Bordages, J. Probarth Sur. Drlg. sh. 2,618 ft.

North Cheek—Jefferson County

Strake Pet., Inc.'s No. 1 J. H. Phelan, S. Stivers Sur. Drlg. sh. 8,836 ft.

Strake Pet., Inc.'s No. 1 Pipkin, H.T. &B. Sur. 15. Drlg. sh. 8,593 ft.

South China—Jefferson County

Titanic Oil Co.'s No. 3-A Broussard, S. Miles Sur. Loc.

Esperson—Liberty County

General Crude Oil Co.'s No. 20 Davis, A. McNeil Sur. 8⅝-in. csg. 7,181 ft.; drlg. sh. 8,027 ft.

General Crude Oil Co.'s No. 12-B Esperson, A. McNeil Sur. R.U.

Martha—Liberty County

Stanolind O. & G. Co.'s No. 1 Garrow, I.&G.N.R.R. Sur. 7, S.D. 8,158 ft.

Wilson Creek—Matagorda County

Barnsdall Oil Co.'s No. 1 Stoddard, G. B. M. Cotton Sur. T.D. 5,350 ft.; D.S. stk.

Segno—Polk County

Gulf Oil Corp.'s No. 4 Quinn, A. Morales Sur. R.U.

Gulf Oil Corp.'s No. 30 Wing, I.&G.N. Sur. 15. Drlg. sh. 4,412 ft.

Gulf Oil Corp.'s No. 32 Wing, I.&G.N. Sur. 14. Drlg. sh. 7,782 ft.

Gulf Oil Corp.'s No. 33 Wing, I.&G.N. Sur. 15. Loc.

Gulf Oil Corp.'s No. 34 Wing, I.&G.N. Sur. 13. Loc.

Joe's Lake—Tyler County

Republic Prod. Co.'s No. 1 fee, A. Sterne Sur. Drlg. sh.&L. 3,312 ft.

Republic Prod. Co.'s No. 35 Wing, I.& G.N. Sur. 15. Drlg. sh. 2,410 ft.

Hilje—Wharton County

Texas Co.'s No. 2 Peters, E.T.R.R. Sur., Sec. 101. Loc.

GULF COAST WILDCATS

Brazoria County

Glenn McCarthy's No. 1 E. W. K. Andrau, H.T.&B. Sur. 5. 10¾-in. csg. 3,512 ft.; T.D. 11,468 ft.; sdtrkd.; drlg. sh. 11,343 ft.

Glenn McCarthy's No. 2 Houston Farm Dev. Co., J. Perry & E. Austin Sur. 7. 10¾-in. csg. 3,492 ft.; drlg. sh. 11,691 ft.

Glenn McCarthy's No. 1 W. B. Munson, Samuel Carter Sur. Drlg. sh. 5,912 ft.

Phillips Pet. Co.'s No. 1 McIlvaine, A.C. H.&B. Sur., Sec. 27. Drlg. sh. 5,026 ft.

Rowan & Nichols Oil Co.'s No. 1 Hubbard, Wm. Harris Sur. R.U.

Chambers County

Sun Oil Co.'s No. 1 Clara C. Smith, T.& N.O. Sur. 82, Drlg. sh. 6,212 ft.

Standard Oil Co. of Texas' No. 61-54 State. Drlg. sh. 5,627 ft.

Colorado County

Cockburn Oil Corp. No. 1 R. W. Ferrs, H. Chrisman Sur. Loc.

Shell Oil Co., Inc.'s No. 1 Plow Realty Co., Obediah K. Winn Sur. Drlg. sh. 3,232 ft.

Fayette County

F. J. Hynes et al's No. 1 A. B. Kerr, J. Parrott Sur. Drlg. sh. 2,936 ft.

Fort Bend County

H. C. Cockburn's No. 1 G. W. Burkett, Bundleck Sur. Loc.

Temple Hargrove et al's No. 1 Sugar Ld. Ind., A. Alcorn Sur. Drlg. sh. 6,176 ft.

Tide Water Asso. Oil Co.'s No. 1 Geo. Armstrong, Jas. Scott Sur. Loc.

Galveston County

Continental Oil Co.'s No. 1 Stewart Title Guaranty Co., Perry & Austin Sur. Drlg. sh. 7,846 ft.

Grimes County

L. J. Sessions et al's No. 1 J. T. Barry, S. Fuelton Sur. R.U.

Harris County

T. A. Carlton Bunte et al's No. 1 Bender, J. W. Singleton Sur. 10¾-in. csg. 1,205 ft.; cd. sd. dist. odor; D.S.T. rec. S.W.; drlg. ahd.

Gulf Oil Corp.'s No. 1 H. H. Roberts, A. Roberts Sur. T.D. 7,583 ft., S.D.

N. W. Hunter et al's No. 1 Green's Bayou Homesites, S. C. Hiroms Sur. 10¾-in. csg. 810 ft.; T.D. 6,514 ft.; abd.

Rowan & Nichols' No. 1 Lobit, B. Barrows Sur. T.D. 7,351 ft.; abd.

Martin Thompson's No. 1 Highlands Farm Corp., J. White Sur. R.U.

Jackson County

W. Stewart Boyle's No. 1 J. M. Bennett, R. Musquez Sur. Drk.

J. F. Hutchins et al's No. 1 Wearden, J. Williams Sur. Loc.

John O'Neal et al's No. 1 Ward est., I.& G.N.R.R. Sur. Loc.

Jasper County

Midwest Co.'s No. 1 W. B. Boykin, M. Rack Sur. Loc.

Jefferson County

Hebert & Smith's No. 1 W. S. Clubb, J. L. Lawhorn Sur. 10¾-in. csg. 1,184 ft.; drlg. sh. 5,276 ft.

Merrimac Oil Corp.'s No. 1 State, Tr. 72, 50 ft. due E of Harwell's abd. hole. W.O.; R.U.

Liberty County

Gulf Oil Corp.'s No. 1 Kirby Lbr. Co., Hugh Means Sur. Drlg. sh. 7,386 ft.

Hebert & Smith's No. 1 W. E. Boyt, H. &T.C.R.R. Sur. T.D. 8,834 ft.; cleaned hole to 8,096 ft.; sdtrkd. 7,824 ft.; 7-in. csg. 8,700 ft.; T.D. 8,865 ft.; set screen; flwg. gas and dist.; T.P. 2,125 lb.; C.P. 2,135 lb.; killed well; perf. csg. 8,598-8,604 ft. and 8,572-80 ft.; fsg.

Matagorda County

Deep Rock Oil Corp.'s No. 1 Tom Petruchs, F. W. Dempsey Sur. Drlg. sh. 3,430 ft.

Marr McLean's No. 3 Gulf-Tex Oil Co., Ira Ingram Lge. R.U.

Stanolind O. & G. Co.'s No. 1 General American Life Ins., J. C. Peyton Sur. Drlg. sh. 7,702 ft.

Texas Gulf Prod. Co.'s No. 1 Gulf Tex. Oil Co., Ira Ingram Sur. Drk.

Texas Co.'s No. 1 Taylor, Freeman George Sur. Drlg. sh. 5,840 ft.

Van M. Vincent's No. 1 J. F. McNabb Est., E. R. Wightman Lge. Loc.

Montgomery County

H. C. Cockburn et al's No. 1 Bender, Montgomery Co. Sch. Ld. and De Crow Sur. Loc.

Continental Oil Co.'s No. 1 Bender est., Montgomery Co. Sch. Ld. Sur. 13⅜-in. csg. 1,243 ft.; drlg. sh. 9,612 ft.

David B. MacDaniel's No. 1 Hattie O. Baldwin, Walker Co. Sch. Ld. Sur. 10¾-in. csg. 1,230 ft.; cg.-for sd. below 9,000 ft.

West Conroe Oil Corp.'s No. 1 R. L. Calfee, H. N. McDillon Sur. S.D. 5,017 ft.; tstd. S.W. 4,516-78 ft.

San Jacinto County

Shell Oil Co., Inc.'s No. 1 Santa Fe Tie & Lbr. Co., J. Rankin Sur. Loc. cleared.

Tyler County

J. C. Bonham's No. 1 Southwestern Lbr. Co., F. Smyth Sur. T.D. 1,340 ft.; P.B. 1,126 ft.; 4-in. csg. 1,107 ft.; flwd. P. L.O. for 3 hrs.; sanded up.

J. Z. Werby's No. 1 Hayes, J. C. Boyett Sur. T.D. 5,526 ft.

Washington County

J. A. Deering's No. 1 C. W. Bohne, S. Gates Sur. Cg. 6,520 ft.

Mount Selman Oil Co.'s No. 1 Fritz Fuelberg, W. Lightfoot Sur. Cg. 5,979 ft.

Wharton County

Cockburn Oil Corp.'s No. 1 Leverage, Jonathan Scott Sur. Drlg. sh. 7,724 ft.

O. C. Garvey's No. 1 T. N. Menefee, S. P. Middleton Sur. Drlg. sh. 4,380 ft.

Humble O. & R. Co.'s No. 1 Wallace & Wells, Morris & Cummings Sur. Drlg. sh. 2,800 ft.

Dr. T. M. Neal's No. 1 fee, Elisha Flack, 4,840 ft.

Strake Pet. Corp.'s No. 1 Poole, Sec. 25, G.H.&H. Sur. T.D. 10,110 ft.; 5½-in. csg. on bttm.; P.B. 9,973 ft.; perf. csg. 9,938-55 ft.; flwd. 3 B.F.P.H., 30% oil, 70% wash wtr.; started to flow 100% S.W.; killed; reperf. csg. 9,927-50 ft.; flwd. S.W.; perf. csg. 9,927-50 ft.; flwg. S.W. and small amt. of oil; tstg.

S. W. TEXAS WILDCATS

Aransas County

Continental Oil Co.'s No. 2 St. Charles Co., R. D. Blassman Sur.; (relief well to blow out); drlg. sh. 3,620 ft.

Atascosa County

Red Bank Oil Co. et al's No. 1 J. P. Pratt Francisco de la Garza Sur. 46; 7-in. csg. 2,347 ft.; set 5½-in. lnr. 3,074 ft.; S.D. 3,276 ft.

Bastrop County

C. R. Franklin's No. 1 Oscar McDonald, Martha Baker Sur. T.D. 2,232 ft.; fsg.

Bee County

Mills Bennett Prod. Co. and Anderson-Prichard Oil Co.'s No. 2 Robinson, J. M. Uranga Sur. (Wlx. test, West Tuleta field), 13⅜-in. csg. 2,537 ft.; 9⅝-in. csg. 7,804 ft.; T.D. 9,210 ft.; perf. csg. 7,545-50 ft.; flwg. dist. and wash wtr.

Sultex Oil Co.'s No. 1 Wood, Jas. McGeehan Sur. T.D. 5,682 ft.; T.D. 5,684 ft.; make D.S.T.

Union Prod. Co.'s No. 56 Ray T. Hanson Sur.; (Pettus field). Wlx. test; 10¾-in. csg. 4,856 ft.; cg. 8,620 ft.

Bell County

J. J. Cormas' No. 1 Jeff Ellis, Elizabeth Berry Sur. S.D. 493 ft.

Bexar County

Joe Noake's No. 1 San Antonio Sub. Irrg. Farm, W. Miller Sur. 180. T.D. 626 ft.; hole bridged.

Philtop O. & G. Co.'s No. 2-A Patton, Fernando Rodriguez Sur. T.D. 1,938 ft.; S.D.

J. A. Tarver's No. 1 Florence Lam, Manuel de Luna Sur. 3. 6⅝-in. csg. 1,205 ft.; T.D. 1,692 ft.; cd. bkn. sh. 1,638-92 ft.; S.S.O.; bailed est. 10 bbl. oil P.D. before sanding up; S.D.

J. A. Tarver et al's No. 1 Joseph Leonard, Manuel de Luna Sur. 3. S.D. 1,696 ft.

Burleson County

H. Y. Barnett's No. 1 Giesenschlag, J. W. Hollingsworth Sur. S.D. 1,935 ft.

Caldwell County

J. E. Dickson's No. 1 Jeff Connolly, J. D. Rains Sur. R.U.

Kean & Williamson's No. 1 E. E. Rector, J. Roberts Sur. S.D. 1,100 ft.

Calhoun County

Coronado Corp.'s No. 1 K. Welder, Hidalgo Sur., 3 mi. SE Seadrift. "Tight well"; reported to be tstg.; 5½-in. csg. 9,750 ft.; perf. csg. 9,500-9,600-9,700 ft.; rec. S.W.; made sqze. job at 8,580 ft.; S.D.

Eura B. Oil Co.'s No. 1 T. P. Traylor, Sec. 3, I.&G.N. Sur. Loc.

Ray-Ranger et al's No. 1 W. W. Wilson, V. Garcia Sur. T.D. 6,525 ft.; abd.

Cameron County

Sal Vieja Oil Co. et al's No. 1 Garcia, Santa Isabel gr. Cg. 9,356 ft.

De Witt County

Atlantic Ref. Co.'s No. 1 Pearl Conwell, Chas. Lockhart Sur. T.D. 8,518 ft.; 5½-in. csg. 8,286 ft.; rec. S.W. 8,030-40 ft.; perf. csg. 7,855-85 ft.; flwg. large vol. dist. and gas; ¼-in. and ⅛-in. ck.

Duval County

Alaska Tex Oil Corp.'s No. 2 W. R. Peters, B.S.&F. Sur., Sec. 791. R.U.

C. Andrade's No. 1 Miller, J. M. Ynojosa gr., Sec. 62. 10¾-in. csg. 624 ft. cg. 5,412 ft.

G. W. Basom's No. 1 Adami, Arnold & Barrett Sur. 47. R.U.

Bridwell Oil Co.'s No. 1 E. A. Parr, T. C. Rogers Sur. Spd.

W. L. Catlin et al's No. 1 Louis Escapule, J. Poitevent Sur. 73. R.U.

Mayfair Oil Corp.'s No. 1 Yates, S.A.&M. G.R.R. Sur. Drlg. sh. 1,552 ft.

P. R. Rutherford's No. 1 Clara Driscoll, U. Lott Sur. 243. T.D. 4,513 ft.; abd.

Sun Oil Co.'s No. 1 Garcia, A.B.&M. Sur., Sec. 407. R.U.

Falls County

J. Shaunfield's No. 1 Barganier, J. M. Graham Sur. Bda. L.; S.S.O.; T.D. 1,188 ft.; recmtd. csg.; W.O.; cmt. failed to hold.

Gonzales County

M. T. Huebner's No. 1 M. P. Smith, R. Plummer Sur. T.D. 1,135 ft.

Guadalupe County

C. E. Euton's No. 1 Echols Yrin Co., Smith Sur. 6. Drlg. sh. 555 ft.

F. W. Nute et al's No. 2 Howell, Jacob Darst Sur. 9. T.D. 167 ft.

F. D. Spratt's No. 1 Wm. Zuchl, Claiborne Rector Sur. S.D. 855 ft.

Hidalgo County

Gulf State Oil Co.'s No. 2 Cardinas, San Salvador del Tule gr. 16-in. csg. 157 ft. T.D. 8,700 ft.; fsg.

Homer P. Lee's No. 1-A Yturria Town & Imp. Co., Anastacio Villareal gr. T.D. 4,514 ft.; abd.

Jim Hogg County

Humble O. & R. Co.'s No. 4 C. T. Mestena O. & G. Co., San Antonio de Balcurate gr. Drlg. sh. 6,215 ft.

Sun Oil o.'s No. 2 East, A.B.&M. Sur. 39. T.D. 5,000 ft.; abd.

Jim Wells County

Frank Gravis, Inc.'s No. 1 Forry, Lavaca gr. Cg. 5,210 ft.

Henshaw Bros.' No. 1 Blasehke, Casa Blanca gr. Loc.

H. H. Howell's No. 1 Garza, La Tinaja De Lara gr. R.U.

M. M. Miller's No. 1 fee, Casa Blanca gr. T.D. 232 ft.; S.D.

W. B. Osborne et al's No. 1 Almond, H. Riggs Sur. 10¾-in. csg. 502 ft.; drlg. 650 ft.

Wm. Spice et al's No. 2 Schaller, Los Presnos de Abajo gr. Loc.

Karnes County

R. W. Ford and Crown Central Pet. Corp.'s No. 1 Ed Jendrusch, Erasmo Seguin Sur. T.D. 2,510 ft.; abd.

Kendall County

C. M. Dewey's No. 2 Seidensticker, R. Davis Sur. 20. S.D. 950 ft.

Kimble County

Austin Bridge Co.'s No. 1 Wilkinson, Brooks & Burleson Sur. S.D. 492 ft.

J. C. Renfro's No. 1 D. C. Morales, Hrs. of H. Grote Sur. 423. T.D. 575 ft.

Schwab-Carlyle & Auld's No. 1 Baker, F. C. Stisser Sur. 417. S.D. 425 ft.

E. E. Sorey's No. 1 Frank Baker, Benj. Underwood Sur. 443. Drlg. 140 ft.

Kinney County

Cooper Gas Co.'s No. 1 L. L. Farr, Geo. L. Bledsoe Sur. 835. T.D. 1,988 ft.; bailing.

Kleberg County

Humble O. & R. Co.'s No. 1 O. J. Mork, Rincon de Santa Gertrudis gr. T.D. 7,917 ft.; abd.

Skelly Oil Co.'s No. 1 State, Laguna de Los Olmos gr., Tr. 385. Cg. 5,420 ft.

Lee County

Fred Pederson et al's No. 1 Brown, David Hudson Sur. T. Glen Rose L. 6,600 ft.; S.D. 7,956 ft.

Live Oak County

H. F. Baker's No. 1 Saunders, Christ Scanlon Sur. 67. T.D. 341 ft.; 5½-in. csg. 340 ft.

H. F. Baker's No. 2 Saunders, C. Scanlon Sur. 67. R.U.

E. M. Jones' No. 1 West, Lot 400, Blk. of West subd. Cg. 9,626 ft.

Luling O. & G. Co.'s No. 2 R. F. Byler, A. A. Dinn Sur. 182. R.U.

Pocono Dev. Co.'s No. 1 San Antonio Joint Stock Ld. Bnk., Richard Everett Sur. 1. S.D. 84 ft.

W. R. Quinn, et al's No. 1 Stolze, J. F. Huizar Sur. 31. Cg. 930 ft.

Smith & Storey's No. 1 Lyne, A.C.H.& B. Sur. 163. Loc.

L. W. Stieren's No. 3 Lange, Thos. Adams Sur. T.D. 1,497 ft.

McMullen County

C. D. Scarborough's No. 1 First Natl. Bk. of Rosebud, Jas. Garner Sur. S.D. 1,955 ft.

Tybro Roy. Corp.'s No. 1 F. B. Horton, Jas. M. Jean Sur. 29. T.D. 656 ft.; run csg.

Van Dresar's No. 2 Brown Sur. 54. Loc.

Medina County

Great Southern Exp. Co.'s No. 1 A. Muennick Sur. 5. S.D. 410 ft.

T. J. Tapp's No. 1 Bendele, F. Sauer Sur. 117. S.D. 205 ft.; T.A.

Milam County

Fritz Fuchs' No. 1 Unaseh, Josie Justo Liendo Sur. T. clk. 1,100 ft.; T.D. 1,895 ft., L.; 5½-in. csg. 1,865 ft.; swbg; no show oil.

Nueces County

Houser-Warren & Ginther's No. 1 Lynn Davis, Palo Alto gr. S.D. 7,024 ft.

Humble O. & R. Co.'s No. 1 D. F. Duncan, Blk. 50, Lot 2. Drlg. sh. 7,020 ft.

John Manley et al's No. 1 Ruegg, Geo. H. Pauls subd. of Driscoll ranch. Loc.

Richardson Pet. Co.'s No. 1 Studer, M. L. De Herrera gr. S.D. 5,990 ft.

Wellington Oil Co. and Seaboard Oil Co.'s No. 1 Swenson, Santa Petronilla Sur. Cg. 6,227 ft.

Refugio County

H. J. Porter's No. 1 R. H. Morrow, E. Perry Sur. Drlg. sdy. sh. 7,100 ft.

San Patricio County

Argo Oil Co.'s No. 1 Mary East, J. P. Borden Sur. Drlg. 2,030 ft.

L. L. Smith's No. 1 Timon, Town Tr. of San Patricio, De Hibernia. Drlg. 1,510 ft.

Texas Gulf Prod. Co.'s No. 1 San Antonio Loan & Tr. Co., M. McAuley Sur. Rec. dist.; 500 lb. W.P.; D.S.T. 6,662-72 ft.

Tide Water Asso. Oil Co. and Sinclair Prairie Oil Co.'s No. 1 Ragsdale, S. S. Gillett Sur. Drlg. sh. 5,315 ft.

Fred Wood et al's No. 1 C. E. Hart, Wm. G. Burgess Sur. 5½-in. csg. 7,250 ft.; perf. csg. 6,904-13 ft.; flwd. small amt. of oil, 4 hrs.; tstg.

Starr County

Hebert Aid's No. 1 Guerra, J. J. Gutierrez Porc. 72. T.D. 750 ft.; abd.

Lynes & Robertson's No. 1 Villareal, C. C.S.D.&G.N.R.R. Sur. 241. Loc.

Sun Oil Co.'s No. 1 W. G. Lehr, C.C.S.D. R.G.N.G.R.R. Sur. Cg. 4,178 ft.

Sun Oil Co.'s No. 1 Rodriguez, Santa Teresa gr. T.D. 7,300 ft.; run csg.

Syndicate Oil Corp.'s No. 1 Sanchez, Santos Sanchez Sur. 344. T.D. 1,004 ft.

Travis County

J. H. Sprouls and A. G. Hinn's No. 1 A. D. Balm, Santiago del Valle gr. Drlg. 125 ft.

L. M. White et al's No. 1 P. C. Wells, J. Harper Sur. 42. Run 7-in. csg.; T.D. 1,695 ft.; abd.

Val Verde County

Joiner Oil Co. et al's No. 1 Clyde Sellers. T.D. 1,848 ft.; S.D.

Victoria County

Colton & Colton's No. 1 Buhler est., I. R.R. Co. Sur. 27. T.D. 2,698 ft.; 5½-in. csg. on bttm.

Humble O. & R. Co.'s No. 1 R. H. Welder, S.A.&M.G. Sur. 9. R.U.

John Mayo et al's No. 1 Hubalak, V. Garcia Sur. Drlg. sh. 6,032 ft.

Webb County

J. M. Anderson's No. 1 Garza, B.S.&F. Sur. 681. T.D. 2,536 ft.; abd.
H. E. Hall's No. 1 Slator, Mission Oil Co., J. V. Borrego gr. Loc.
M. L. Massingill's No. 2 Kirkpatrick, C. C.S.D.&R.G.N.G. Sur. 59. Loc.
Milo Orr et al's No. 1 Garza, C.C.S.D.& R.G.N.G. Sur. 47. Drlg. sh. 40 ft.
V. G. Schimmel's No. 1 Volpe, Mary H. Pennell Sur. 689. T.D. 4,102 ft.; abd.
Sinclair Prairie Oil Co.'s No. 1 Callaghan Ld. & Cattle Co., B.S.&F. Sur. 585. 13⅜-in. csg. 1,598 ft.; S.D. 6,240 ft.
Texas Co.'s No. 1 Billings, C.C.S.D.&R. G.N.G. Sur. 31. S.D. 400 ft.

Williamson County

C. C. Lanier's No. 1 Guental, Harry Cooke Sur. R.U.
Taylor Ref. Co.'s No. 2 Hurta, P. Coursey Sur. T.D. 1,399 ft.; abd.

Wilson County

Henshaw Bros.' No. 1 E. W. Schneider, Don Casper Flores Sur. 10-in. csg. 99 ft.; T.D. 3,331 ft.; prep. to D.D.
W. D. Moore et al's No. 1 Lorens, Morris May Sur. S.D. 75 ft.
E. E. Young's No. 1 O. D. McMeans, C. W. Parrott Sur. S.D. 755 ft.

Zapata County

J. P. Martin et al's No. 1 Serapio Vela, El Grullo gr. T.D. 3,108 ft.; sdtrkd.; T.D. 3,505 ft.; 5½-in. csg. 2,906 ft.; P. B. 3,105 ft.; tstg.

Zavala County

H. F. Wilcox O. & G. Co.'s No. 2 Storey. G.W.T.&P.R.R. Sur. T.A.C. 3,430 ft.; drlg. clk. 3,450 ft.

WEST TEXAS WILDCATS

Andrews County

Richmond Drlg. Co. and T. F. Hunter's No. 1 University, 660 ft. N and E lines of Sec. 21, Blk. 11, University Sur. Prep. D.D. to new contract depth, 5,900 ft.

Concho County

Charter O. & G. Co.'s No. 1 T. Y. Hill, SW part of Julius Frederick Sur. 1693, Abst. 198. Drlg. 1,962 ft.
Floyd Dodson's No. 1 Wilson, Thomas Green Sur. 1; 3,500-ft. test. Drlg. 2,700 ft.

Crane County

Gulf Oil Corp.'s No. 5 M. B. McKnight, Sec. 1, Blk. 21-B, P.S.L. Sur. C.O. cave 6,342 ft.
Gulf Oil Corp.'s No. 1-K University, 330 ft. N and E lines, Sec. 2, Blk. 31, University Sur. Drlg. 2,960 ft.
Gulf Oil Corp.'s No. 12 Waddell, Sec. 30, Blk. 26-B, P.S.L. Sur. 12-in. 532 ft. S.O. 3,215-20 ft.; S.S.G. 3,635 ft.; 8-in. csg. cmtd. 3,713 ft.; S.O. wtr. 3,763 ft. S.D.O. 3,763 ft.
Gulf Oil Corp.'s No. 31 Waddell, Sec. 5, Blk. 24-B, P.S.L. Sur. M.I.M.

Crockett County

Clark & Cowden's No. 1 G. D. Atwood, Sec. 49, Blk. H.H., G.S.&S.F. Sur. Loc.
Continental Oil Co.'s No. 2 Todd, 1,980 ft. S and W lines of Sec. 29, Blk. W X, G.C.&S.F. Sur. Skd. rig W; T. crinoidal L. with sat. at 5,590 ft. and drld. in sat. to T. Simp. at 5,690 ft.; set csg. and tstd. 87 B.O. hrly.; prep. comp. as new field discovery; flwd. 840 bbl. in 12½ hrs. official ga.; S.I.
Continental Oil Co.'s No. 3 Todd unit, Sec. 29, Blk. WX, G.C.&S.F. Sur., E offset to discovery well. R.U.M.
Soma O. & G. Synd.'s No. 1 W. T. Noelke, NW part Sec. 30, Blk. GG, H. E.&W.T. Sur. S.D. 400 ft.

Ector County

Ralph R. Gill's No. 1 Parker, SE¼ Sec. 12, Blk. 45, T-2-S, T.&P. Sur.; deep Holt horizon test. Drlg. below 5,530 ft.
M. A. Grisham et al's No. 1 R. B. Cowden, 600 ft. from N and E lines, Sec. 4, Blk. 45, Twp. 1n (deep test), T.&P. R.R. Sur. Cg. below 5,870 ft.
Western & Southern Oil Co.'s No. 1 Smith, NW cor. Sec. 6, Blk. 42, T-1-S, T.&P. Sur.; deep Holt-horizon test. C.O. 4,431 ft.

Hudspeth County

Haymon Krupp Oil & Ld. Co.'s No. 1 Briggs, Sec. 24, Blk. 73, Twp. 7, T.& P. Sur. Drlg. 6,167 ft.

Loving County

J. E. Whitesides' No. 1 fee, Sec. 24, Blk. 76. Prep. run 10-in. 1,132 ft.; S.S.O.; S.D. 5,284 ft.; S.W. 5,258 ft.

Mitchell County

Ewing & Hanes' No. 1 G. I. Grable, Sec. 195, Blk. 3, H.&G.N. Sur.; 1,800-ft. test. Drlg. 1,185 ft.
N. V. Hilburn's No. 1 E. T. Strain, Sec. 82, Blk. 97, H.&T.C. Sur. S.D. 1,290 ft.

Pecos County

Humble O. & R. Co.'s No. 1 Young, Sec. 33, Blk. 10, H.&G.N. Sur. Top detrital 5,185 ft.; T. Simpson 5,624 ft. after logging 504 ft. of detrital; drlg. 6,585 ft.; still in Simpson.
H. H. Sides' No. 1 Blackstone-Slaughter, Sec. 29, Blk. 129, T.&St.L. Sur., 1,050 ft. W, 250 ft. S lines of section. Drlg. 380 ft.
R. L. Walker's No. 1 White & Baker Sec. 86, Blk. 194, G.C.&S.F. Sur. Prep. shoot 2,016 ft.; S.S.O. at T.D.

Scurry County

Coffield & Guthrie, Inc.'s No. 1 J. W. Moar, Sec. 334, Blk. 97, H.&G.N. Sur., NW Sec.; 4,500-ft. test. Drlg. 212 ft.

Stonewall County

Shell Oil Co., Inc.'s No. 1 Smith, Sec. 143, Blk. 1, H.&T.C. Sur. Tstg. W.S.O. 5,617 ft.; prep. test.
W. I. Southern's No. 2 Carlisle, Sec. 293, Blk. D. H.&T.C. Sur. T. Ellenburger 5,540 ft.; S.S.O. 6,543 ft.; P.B. to 5,544 ft. to test in Ellenberger L.; T.D. was 6,728 ft. in Hickory sd. Rng. tbg. to treat at P.B. depth 6,555 ft. from 6,728 ft., T.D.

Terrell County

E. M. Thomasson's No. 2 Bates, Sec. 30. Blk. 1, I.&G.N. Sur. S.D.R. 1,070 ft. S.S.G.

Terry County

Geo. P. Livermore's No. 1 M. E. Jacoonson, Sec. 6, Blk. 11-D, C.&M. Sur. Drlg. 4,367 ft.
Tide Water Asso. Oil Co.'s No. 1 Lowe, SW part Sec. 3, Blk. 37-C, P.S.L. Sur. Drlg. 4,210 ft.

Tom Green County

B. C. Mann's No. 1 Joe Funk, 330 ft. N, 1,650 ft. E lines, Sec. 34, Blk. 5, H.& T.C. Sur. S.D. for line 1,315 ft.
Dan Short's No. 1 J. G. Davidson, 2,161 ft. from SL, 2,493 ft. from NW cor. L. P. Moore Sur. S.S.O.&G. 2,660-65 ft.; fsg. bailer 3,325 ft.

Ward County

Atlantic Ref. Co.'s No. 1 Wickett-University, Sec. 12, Blk. 16, University Lds. Sur., 1,980 ft. N and E lines of section. Loc.
Gulf Oil Corp.'s No. 5 Wristen, Sec. 13, Blk. 5, H.&T.C. Sur.; scheduled Ordovician test. Drlg. 6,405 ft.
Kenneth Slack's No. 1 Bird Hayes, Sec. 148, Blk. 34, H.&T.C. Sur. T. Delaware 5,003 ft.; S.D. 5,010 ft.

TEXAS PANHANDLE

Ochiltree County

James R. Macon et al's No. 1 W. R. Norris, SW SE Sec. 212, Blk. 43, H.&T.C. Sur. T.D. 6,274 ft.; test sec. at 5,000 ft.; est. 6,000,000 cu. ft. gas on D.S.T.; tstg.; bailing 6,274 ft.; unloaded csg. at well and preparing to test increasing shows of oil and gas. C.O. and drilling up junk; prep. to test.

Potter County

Canadian River Gas Co.'s No. 1 City of Amarillo, in city limits just north of city. Drlg. 4,316 ft.

Sherman County

I.T.I.O. Co.'s No. 1 S. C. Bryant, C NW¼ Sec. 369, Blk. T-1, T.&N.O. Sur. Drlg 4,000 ft.

E. C. TEXAS WILDCATS

Cherokee County

Shell Oil Co., Inc.'s No. 1 S. H. Manes, J. M. Musquez Sur., 4 mi. S of Recklaw. Spd.

Falls County

City of Lott's No. 1 City of Lott, W. Gilmore Sur. Drlg. 1,650 ft.
M. Hays' No. 1 A. N. Taylor, F. Mahhan Sur., 1 mi. NE of Lott. Topped Buda 1,175 ft.; W.O.C.

Freestone County

C F. W. Young's No. 1 Ray Simmons, M. DeCantona Sur., 1½ mi. W of Simmsboro. Drlg. 550 ft.

Gregg County

Roger Lacy's No. 1 Lacy, S. P. Ford Sur., 3 mi. SW of Longview; deep Trinity gas test. Drlg. 3,304 ft.

Henderson County

Dilworth Hager's No. 2 Coleman & Faulk, R. S. Rayburn Sur., 3½ mi. NW of LaRue. Prep. abd. 4,560 ft.; wtr. in Woodbine sd.

Kaufman County

T. G. Shaw, Tr.'s No. 1 Angus Wynne. B. S. Newman Sur., 8 mi. E. Kaufman. lower Trinity test. Drlg. 210 ft.

Limestone County

Peyton Bros.' No. 1 Harris, P. Varell Sur. T. Pett. 5,549 ft.; cd. to 5,617 ft. with S.S.O.; D.P. stk. at 5,677 ft., T.D. pulled D.P. apart; S.D.O.

Navarro County

C. F. Carter's No. 1 Allen Eden. M. Shire Sur., 2 mi. NE of Angus. Bailing. wtr.; S.S.O.; 1,201 ft.
M. M. Johnson's No. 1 Flemming, J. Smith Sur., 5 mi. SE of Corsicana. Drlg. 1,250 ft.

Smith County

Sun Oil Co.'s No. 1 E. B. Huddle, Wm. Dickerson Sur., 2 mi. S of discovery dist. producer in Chapel Hill area; third D.S.T. failed; may test again or may P.B. to Glen Rose L.; sat. drld. from 7,963-8,019 ft.; T. Pett. 7,930 ft.; T. Tr. Pk. 8,090 ft.; tstg.; T.D. 8,226 ft.; est. 5 B.O. with wash wtr.; prep. drill plug at 8,226 ft.; P.B. 8,183 ft.; prep. shoot and test.

Van Zandt County

J. B. Daniels' No. 1 W. R. Odom, J. Garcia Sur., 4 mi. NE of Mabank. Drlg.
E. L. Shackelford's No. 1 E. J. Combs, J. Wright Sur., 3½ mi. NW of Grand Saline. S.D. 54 ft.

EAST TEXAS

(Border Counties)

Harrison County

Fohs Oil Co.'s No. 1 R. L. Sypert, R. Hooper Sur. Loc.
J. A. Hughes' No. 1 Taylor, H. McNutt Sur. T.D. 2,612 ft.; W.O.S.R.

Marion County—Other

John Coates' No. 1 Burr et al, 3,200 ft. NL, 350 ft. EL, John Reeves Sur. Cg. sh.&sd. 2,310 ft.
B. I. Daniels' No. 1 T. O. Livingston, G. Coore Sur. T.D. 2,330 ft.; W.O. csg.
T. B. Donnell's No. 1 E. W. Easterling, 330 ft. S, 1,200 ft. W, NE cor. 200-ac. tr., M. G. Nall Sur. T.D. 2,341 ft.; set 5⅛-in. csg. 2,234 ft.; W.O.S.R.
M. D. Fitzwater's No. 1 C. Moseley, 330 ft. SE cor. 100-ac. tr., W. H. Burton Sur. T.D. 1,529 ft.; dropped in cavity at 1,519 ft.; W.O.
H. T. Manning's No. 1 T. O. Livingston, G. Coore Sur. Plts.
Sanders & Wycliffe's No. 1 M. E. Livingston, W. Coore Sur. Set 10-in. csg. 42 ft.; set 5½-in. csg. 2,306 ft., T.D.

Marion County—Rodessa

C. M. Beckett's No. 1 Perry, 466 ft. NW cor. Perry 126-ac. tr., C. Grayson Sur. Drlg. sh.&L. 4,356 ft.
Holcomb & Thomason's No. 1-A Madine, 400 ft. WL, 467 ft. NL, 33.6-ac. tr., A. D. S. Coy Sur. Set 9⅝-in. csg. 1,840 ft.; Hill sd. 5,979 ft.; Gloyd 6,092 ft.; set 6-in. csg. 6,118 ft.; perf. 6,082-93 ft. and 6,093-6,112 ft.; sqzd. 6,082-93 ft.; tstd. est. 1,000,000 cu. ft. gas and sprayed oil; 22/64-in. ck.; T.P. 1,050 lb.; C.P. 825 lb.; resqzd. 6,082-93 ft.; cut off gas and making small amt. oil; W.O. 6,118 ft.

Shelby County

Earl McDaniels et al's No. 1 J. S. Swann, 470 ft. EL, 1,400 ft. SL, 100-ac. tr., Ann Gray Sur. T.D. 2,378 ft.; 9⅝-in. csg. 585 ft.
Superior Oil Co.'s No. 1 Pickering Lbr. Co., 990 ft. E, 330 ft. N, SW cor. Lot 4, W. J. Crane Sur. T. Midway 1,555 ft.; T. Cane River 1,850 ft.; T. Annona 1,955 ft.; T.D. 2,658 ft.; P.B. 2,625 ft.; tstd. 5% oil and 95% mud and S.W.; recmtd. 2,615 ft.; 7-in. csg. set 2,595 ft.; oil sd. 2,618-21 ft.; pulled 1,910 ft. of 7-in. csg.; prep. P.B. 1,918 ft. and comp. as gas well.

WEST CENTRAL TEXAS DISTRICT

Brown County

M. R. Staurd's No. 1 E. Hennigan, NW M.E.P.&P. Sur.; 1,000-ft. test. Rng. csg. 834 ft.

Callahan County

D. Fox and E. L. Dunn's No. 1 A. and G. Berry, NE pt. Sec. 78, B.O.A. Sur., 950-ft. test. Drlg. 905 ft.
Green & Owens' No. 1 Murray, 156 ft. from N and 1,725 ft. from E lines of Jacob Track Sur. 761. C.O. after fsg. tools 867 ft.
W. Lee's No. 1 H. W. Ross, 2,420 ft. W, 1,540 ft. S lines, Sec. 98, B.B.B.&C. C. Sur. S.D. csg. 1,348 ft.
C. A. Redmond's No. 1 H. T. Moore, SE cor. NE Sec. 9, Blk. 6, S.P. Sur.; 2,000-ft. test. Drlg. 1,305 ft.

Coleman County

Anzac Oil Corp.'s No. 1 McCord, 2,200 ft. E, 2,196 ft. S of B.B.B.&C. Sur. Drlg. 950 ft.
J. C. Ort's No. 1 Emet Walker, SE cor. Hicks Sur. W.O.C. 700 ft.
J. W. Quinn, Tr.'s No. 1 Duty & Stevens, SE cor. Sec. 25, H.T.&B. Sur.; 1,800-ft. test. Loc.
Robertson & Bradford's No. 1 Morris, 330 ft. N, 1,582 ft. W lines, Blk. 2, G.H.&H. Sur. Prep. test; Gardner sd. topped at 3,530 ft. with sat.

Coryell County

Kistler O. & G. Co.'s No. 1 Barnes, 360 ft. SE line, 3,700 ft. NE line of H. Farley Sur., 3 mi. NE of Gatesville; 2,500-ft. test. Drlg. 680 ft.

Eastland County

Dobbs Oil Corp.'s No. 1 Mrs. R. L. Poe, 1,320 ft. from S and E lines, of SE¼ Sec. 37, Blk. 3, H.&T.C. Sur. Cmtg. csg. 800 ft.
Dobbs Oil Corp.'s No. 1 Thomasson, S. H. Key Sur., 330 ft. from N, 846 ft. from E lines of 80-ac. tr. Drlg. 750 ft.
Hickok Prod. & Dev. Co.'s No. 1 Wright & Harrell, 2,485 ft. from east, 2,845 ft. from S lines of J. B. Hozle Sur., 4 mi. NE of Cisco. Rmg. 859 ft.
States Oil Corp.'s No. 1 V. N. Owens, NE Sec. 23, Blk. 2, T.&N.C. Sur. Tstg. 6,304-33 ft. in Gardner sd.

Erath County

T. G. Jackson's No. 1 J. W. Taylor, Prater Sur., Abst. 1029, 4 mi. NE of Desdemona. Est. 15 to 20 B.O.P.D. at 3,360-75 ft.; S.D. 3,395 ft.; not treated. fsg. tools 3,395 ft.

Hamilton County

A. J. Caldwell's No. 1 W. W. Jones, 1,002 ft. from NE, 150 ft. from SE lines of W. H. Crowder Sur. Drlg. 1,700 ft.

Jones County

J. E. Farrell's No. 1 F. B. Reid, NW¼ Sec. 31, D.&D. Sur.; 3,500-ft. test. Drlg. 2,500 ft.
Humble O. & R. Co.'s No. 1 Ed Glift, 453-ac. tr. in E½ of Ambrose Crain Sur. 214. Drlg. 3,986 ft.
T. D. Humphrey's No. 1 Triplet, J. J. Hughes Sur. 201, 3 mi. NW Hawley field. Cook sd. 2,185-93 ft.; flwg. by hds.; tstg.
Iron Mountain Oil Co.'s No. 1 I. F. Wiley, 330 ft. from S and E lines SW¼ Sec. 14, Deaf & Dumb Ld. Drlg. 2,400 ft.
Jones & Stasney's No. 1 B. C. Humphrey, SE cor. SW Sec. 192, B.B.B.&C. Sur., 1 mi. N of Avoca field. Loc.
Lewis Prod. Co.'s No. 1 M. T. Ramsey, NE cor. Sec. 80, Blk. 14, T.&P. Sur.; 2,000-ft. test. S.D. csg. 1,721 ft.
W. I. Southern's No. 1 A. A. Hayden, G. Martinez Sur., S of Anson on west side of Prichard pool; 4,000-ft. test. Rmg. 1,966 to 2,035 ft., T.D.

Parker County

Brown & Gardner Bros.' No. 1 Gilbert, T.&P. Sur., Abst. 1958. Tstg. gas; prep. D.D.

Shackelford County

Georgian Oil Corp.'s No. 1 Black ranch, C NE¼ of T.E.&L. Sur. 390, 10 mi. NE of Albany; Ordovician test. Drlg. 3,750 ft.
Swann & Gorsuch's No. 1 Sam Lazarus, SE SE Sec. 80, Blk. 13, T.&P. Sur. Drlg. 605 ft.

Stephens County

Guy Ewing's No. 1 Crudington, SE cor. T.E.&L. Sur. 1268, 5½ mi. S of Stribling field. Loc.
Jones Bros. Drlg. Co.'s No. 1 T.X.L., 660 ft. N and E lines SE Sec. 3, Blk. 3, S.P. Sur.; 4,050-ft. test. Drlg. 2,000 ft.
Panhandle Ref. Co.'s No. 1 Frank Magers, SE Sec. 1, Blk. 3, S.P. Sur., 1¾ mi. N of Fagg area. Drlg. 3,600 ft.
Pitzer & West and Brazos-Young Oil Corp.'s No. 1 H. Compton, SW SW Sec. 9, O.A.L. Sur., 1 mi. SE of Loving pool; 3,600-ft. test. Drlg. 1,800 ft.
J. R. Tolbert's No. 1 W. L. Martin, NW cor. NE¼, Blk. 1335, T.E.&L. Sur., 1½ mi. SW of Fagg area. Spdg.

Taylor County

Texas Pacific Coal & Oil Co.'s No. 1 N. A. Reidenback, 990 ft. from N and W lines of Lot 19, Lge. 146 County Sch. Lds. Rmg. 2,355 ft.

NORTH TEXAS WILDCATS

Archer County

W. H. Gant's No. 1 A. Vogtsberger, Sec. 3, G. E. Co. A-146. Drlg. 3,908 ft.; 5,200-ft. test.

Baylor County

Paul B. Scott et al's No. 1 C. H. Farr, Sec. 228, T.&N.O. Sur.; 3,100 ft. test. Drlg. 800 ft.
Hall Jordan's No. 1 F. C. Green, C Lot 29, J. E. Hix Sur., Abst. 1376, Sat. L. 3,061-64 ft.; treated with 3,000 gal. acd.; flwd. and swbd. 185 bbl. 6 hrs.; comp.

Clay County

Fulwood, Johnson & O'Connor's No. 1 R. L. Oliver, Sec. 2646, T.E.&L. Sur.; 4,100-ft. test. Drlg. 1,575 ft.
Alexander Goldsmith's No. 1 Republic Nat. Gas Co., 312 ft. N, 495 ft. W lines of Blk. 14, Parker Co. Sch. Ld. Sur., 1 mi. S of town of Petrolia; 4,500-ft. test; drlg. 1,890 ft.
Staley Oil Co.'s No. 1 D. J. Percifield, Sec. 37, Belcher subd.; 5,000-ft. test. Spd. and W.O.R.
Carlos Wagner's No. 1 L. C. Thaxton, 3,630 ft. S, 330 E lines of 301-ac. tr., W.C. Donley Sur., Abst. 129, Sec. 4; 5,000-ft. test. Spd. and S.D.

Cooke County

C. E. Marshall et al's No. 1 Mrs. H. M. Stork, Sec. 13, B.B.B.&C. Sur. A-155; 5,200-ft. test. R.U.R.

Denton County

Jones Drlg. Co.'s No. 1 H. Chapman, L. Moore Sur., Abst. 824. T.D. 1,800 ft.; P.B. 1,634 ft.; to perf. csg.; O.S. 1,609-15 ft.; P.O.P.

Foard County

Ohio Oil Co.'s No. 1 M. E. Rasberry, NE cor. Sec. 26, S.P. Sur., 5,000-ft. test. Drlg. 4,000 ft.

Hardeman County

Norris & Gilbert's No. 1 Robert Weekley, SW SE Sec. 87, Blk. 16, H.&T.C. Sur. Drlg. 2,490 ft.

Jack County

H. R. Smith's No. 1 I. G. Yates, SW cor. John Holderman Sur., 6 mi. NW Jacksboro. Drlg. 1,585 ft.

Montague County

Seitz, Comegy & Seitz' No. 1 King, 1,903 ft. W, 330 ft. N lines of SE¼ E. B. Wooten Sur., Abst. 480. Drlg. 2,025 ft.
Wm. J. Payne's No. 1 T. M. Baker, NW¼ Lot 42, W. J. Wells Sur., Abst. 844, 5,000-ft. test. Drlg. 4,870 ft.
Ramsey Pet. Corp.'s No. 1 W. H. Magee, A. C. Davis Sur., just outside of town of Montague. Drlg. 3,460 ft.
E. C. Harlin, Jr., et al's No. 1 I. H. Kemner, SE cor. Blk. 28, Lge. 1, Denton Co. Sch. Lds. (5,200-ft. test). Drlg. 5,620 ft.

Wilbarger County

Amerada Pet. Corp.'s No. 1 B. Goodpasture, Sec. 35, H.&T.C. Sur., Blk. 15, 8,000-ft. test. Drlg. 3,375 ft.

Oklahoma Fields

(Continued from Page 109)

Simpson-Roodhouse Drilling Co.'s No. 4 James, NE SE SE Section 9-5-3, defined the Byars pool on the northeast. It found Viola lime at 3,645 ft., had Wilcox sand at 3,995 ft., was bottomed at 4,005 ft., nothing was showing and it was dry and abandoned.

Okfuskee County

Summit Drilling Co.'s No. 4 Steil, SE NW SW Section 18-10-11, Weleetka area, Okfuskee County, topped Booch sand at 2,142 ft., total depth 2,151 ft., flowed 1,053 bbl. of oil in 9 hours, was pinched to 65 bbl. daily and completed.

Same company's No. 5 Steil, NE NW SW Section 18-10-11, flowed 612 bbl. of oil in 12 hours, was pinched to 65 bbl. daily and completed. It had sand at 2,190 ft., total depth 2,198 ft.

Seran's No. 3 Seran, NW SE NW Section 2-11-8, Dill area, was dry and abandoned at 3,450 ft., total depth.

Olsen's No. 1 McCool, SE NE NE Section 20-13-10, found Wilcox sand at 3,515 ft., and was dry and abandoned at 3,523 ft.

Hughes County

Hugh Canavan's No. 3 Meadors, NW NE SE Section 5-8-10, North Yeager area, Hughes County, topped Hunton lime at 3,748 ft., Sylvan shale 3,887 ft., and was dry and abandoned at 3,880 ft.

New work in Seminole County: Commercial Drilling Co.'s No. 1 Douglas, SW NE SE Section 30-8-8, cellar and pits; Hansberger's No. 1 Wilson, SW SW SE Section 36-9-3, cellar and pits.

Creek County

Chapman's No. 3 McNac, SE SW SE Section 35-15-10, Slick-Wilcox area, Creek County, topped Wilcox sand at 3,119 ft., total depth 3,141 ft., plugged back to 3,138 ft. and was shot. It pumped 20 bbl. of oil and 50 bbl. of water daily.

Sinclair Prairie Oil Co.'s No. 6 Yahola, SE SE NW Section 9-17-7, an old well, was deepened from 2,721 ft. to 2,734 ft., was shot and pumped 1 bbl. of oil daily.

Bryan Petroleum Co.'s No. 1 Posey, NE NW SW Section 22-18-9, had sand at 2,515 ft. and was dry and abandoned at 2,862 ft.

First reports of new work in Creek County: Chapman's No. 4 Brooks, SW SW SW Section 36-15-10, cellar and pits; Moore's No. 3 Mosquito, NE SW NE Section 20-17-9, location; McAdams & Thornton's No. 2 McMahon A, SE NE SE Section 63-17-9, spudded; Giblin's No. 1 Reed, SE NW SE Section 31-18-10, drilling below 815 ft.

Oklahoma County

Phillips Petroleum Co.'s No. 1 Shirley, SE SE NW Section 34-12-3w, on the west side of the Oklahoma City field, south of the Capitol extension, Oklahoma County, flowed 997 bbl. of oil the first 24 hours and 929 bbl. the next 24 hours. It topped Wilcox sand at 6,380 ft., was bottomed at 6,543 ft., and was shot at 6,495-6,543 ft.

Caddo County

Newsome's No. 1 McKenna, SW NE NW Section 31-6-9w, Cement field, Caddo County, an old well bottomed at 4,980 ft., was cleaned out and casing perforated, but it was dry and abandoned.

Same operator's No. 1 Westerfield, SE NW NW Section 31-6-9w, was dry and abandoned at 3,532 ft.

Olson Oil Co.'s No. 3 Rigney, NE SE NE Section 12-5-9w, was an abandoned location.

Ohio Oil Co.'s No. 7 Wagner, NW SE SW Section 12-5-9w, was building rig. Continental Drilling Co.'s No. 1-B Pierson, NE SE SE Section 35-6-10w, was a rig.

Miscellaneous Completions

Wilcox Oil & Gas Co.'s No. 6 School land, SE SE NW Section 16-14-6, Sac and Fox pool, Lincoln County, had Prue sand at 3,120 ft., total depth 3,143 ft., was shot and pumped 5 bbl. of oil in 24 hours.

Swift's No. 1 Peterman, C W½ W½ NW Section 24-20-9, Keystone area, Pawnee County, was dry and abandoned in Layton sand at 1,245 ft., total depth 1,281 ft.

Olson Oil Co.'s No. 5 Osage, CWL NE NW Section 24-26-4, Kaw pool, Osage County, was shot and swabbed 50 bbl. of oil daily from Skinner sand at 3,174 ft., total depth 3,206 ft.

Burke's No. 1 McKee, NE NE NW Section 20-28-1w, old well in southeast Braman area, Kay County, was deepened from 2,500 ft. to 2,815 ft. and was dry and abandoned. Carter Oil Co.'s No. 1 Chrisman, C W½ SW NW Section 16-25-3w, old well in the Lamont area, Grant County, plugged back from 5,400 ft. to 5,385 ft., ripped casing, acidized and pumped 265 bbl. of oil and 900 bbl. of water daily. In the last 24 hours before plugging back it pumped 23 bbl. of oil and 800 bbl. of water. Sinclair Prairie Oil Co.'s No. 2 Smith, SE SE NE Section 28-22-2w, old well in the Polo pool, Noble County, was plugged back to Layton sand at 3,746-3,824 ft. and swabbed 70 bbl. of oil and 15 bbl. of water in 24 hours.

Critchlow's No. 7 Adair, CWL SW NW Section 27-3-5w, Knox pool, Grady County, had sand at 2,538 ft., total depth 2,559 ft., perforated casing in sands at 2,419-35 ft., 2,487-2,507 ft., and flowed 125 bbl. of oil in 24 hours.

McCasland's No. 1 Slusher, NE NE SE Section 28-3n-5w, Grady County, was deepened from 2,663 ft. to 2,685 ft., and recompleted for 12,000,000 cu. ft. of gas daily.

First Reports

Magnolia Petroleum Co.'s No. 1 Harley-Unitized, C NW NE Section 24-2s-4w, Stephens County, location for a Hunton lime test. Central's No. 1 Hefner, NE NW SW Section 12-1n-5w, Stephens County, building rig. McCasland's No. 2 Slusher, CNL NE SE Section 28-3n-5w, Grady County, location. McIntyre's No. 1 Mitchell, NW NW SE Section 19-7-17w, Kiowa County, location. Batson's No. 1-A Walker, NW SW NE Section 20-4s-2w, Grady County, moving in rotary tools. Jones' No. 4 Sullivan, SW NW SE Section 36-4s-2w, Carter County, rig on ground. Hoss' No. 1-A McCallom, SE SW NW Section 14-20-9, Pawnee County, rigging up machine. Ray Dunnett's No. 1 Townsite, NE NW SE Section 33-18-5, Payne County, cellar.

California Fields

(Continued from Page 114)

the completion of No. 39 Rosecrans by Union Oil Co., flowing 505 bbl. of clean 29.3-gravity oil and 692,000 cu. ft. of gas per day from the O'Dea zone with bottom of the hole at 7,950 ft. The well flowed through a 40/64-in. bean behind a tubing pressure of 130 lb. and a casing pressure of 550 lb. It was finished with a 7-in. water string cemented at 7,525 ft. and 419 ft. of 5½-in. liner landed at 7,947 gt. and carrying perforations at intervals between 7,525 and 7,947 ft. Production was flowed through 7,868 ft. of 3-in. tubing. New wells are being started by Rainbow Drilling Co. on the Duncan lease, Mission Oil Co. on the Pierce lease, Thomas Sidwell on the Founders lease, Southern California Petroleum Co. on the Slabaugh lease, and by St. Anthony Oil Corp., on the Gorden lease on which a recent completion was recorded. Development work in the area immediately south of the Rosecrans field has been both hot and cold, due to the varying success of wells from time to time. This area up to the present has been especially spotty, with very little success accompanying wells carried down to 9,100 ft. or deeper.

Long Beach

In the Long Beach field Johnson Drilling Co., Long Beach pioneer, completed No. 40 Signal, pumping 126 bbl. of 21.5-gravity oil, cutting 16 per cent daily from 3,702 ft. and Texas Co. completed No. 10-A Davidson, pumping 58 bbl. of 23.6-gravity oil per day from 4,715 ft. No. 40 Signal was finished with an 8⅝-in. water string cemented at 3,652 ft. and 103 ft. of 5-in. liner landed on bottom and perforated at 3,652-3,702 ft. No. 10-A Davidson was finished with an 8⅝ in. water string cemented at 3,845 ft. and 902 ft. of 6⅝-in. liner landed at 4,712 ft., and carrying 80-mesh perforations at 3,852-4,712 ft. Concerted attempts to develop deep production in the Long Beach field have failed to click, due to lack of sufficient gas pressure, to show large sustained production. One well was finished in a new deep zone about 2 years ago, but lack of gas necessitated the use of artificial stimulation.

San Joaquin Basin

Belridge Oil Co., which owns in fee several sections in the North Belridge district, completed No. 11-1 fee this week, flowing 931 bbl. of clean 31.9-gravity oil and 4,250,000 cu. ft. of gas daily through a 96/64-in. bean from the Wagonwheel zone with bottom of the hole at 8,380 ft.; tubing pressure 550 lb., and casing pressure 950 lb.

Coastal District

Tide Water Associated Oil Co. completed No. 43 Ventura Land & Water in the prolific Ventura Avenue field, flowing 2,583 bbl. of clean 31.9-gravity oil and 2,400,000 cu. ft. of gas daily from 9,886 ft. This well, which was brought in flowing through two 2-in. beans, was finished with a 7-in. water string cemented at 9,460 ft. and 480 ft. of 5-in. liner landed at 9,880 ft. and perforated at 9,468-9,880 ft. In addition to the water string, the company landed a protective string of 9⅝-in. at 6,163 ft. California Alliance Oil Co. is drilling ahead in No. 2 Hartman a little below 9,200 ft., which a recent check indicated, is still above the deep 57-zone from which the company hopes to produce. It is likely that this well will be carried down to 10,000 ft. for completion unless production is assured above this depth. Union Oil Co. completed No. 4 Le Roy in the Santa Maria Valley field at 5,482 ft., but no gage has yet been made.

FOR DEPENDABLE PROTECTION

● REILLY PIPE ENAMEL and PRIMER gives completely dependable and permanent protection of oil and gas transmission lines against corrosion. Even through wide extremes of temperature, Reilly coatings remain bonded to the steel. Write for the booklet on Reilly Protective Coatings.

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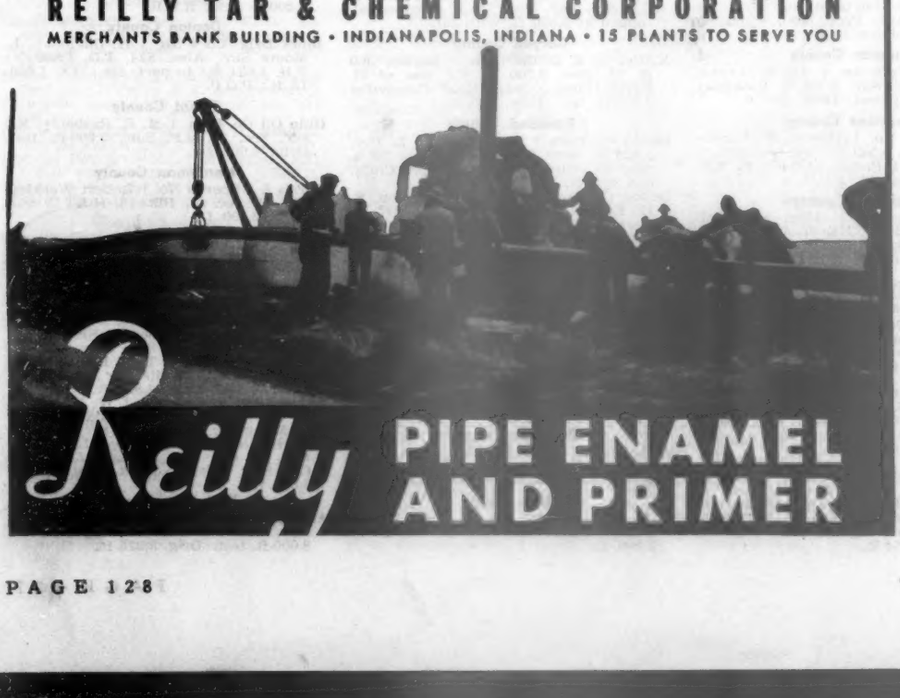


Reilly PIPE ENAMEL AND PRIMER

Four Wells Added to Tinsley; Dry Hole in Warren County

By GEORGE WEBER

JACKSON, Miss., Apr. 8.—Four oil wells were completed in the Tinsley field in Yazoo County in the past week. They produced an aggregate of 2,220 bbl. in initial production. Three of the wells were drilled by Union Producing Co., the fourth by Edgar B. Johnson. A wildcat in Warren County was abandoned as dry at 4,490 ft.

There are 35 producing wells in the Tinsley field, producing 8,490 bbl. a day as an average for the past week.

The Mississippi, Alabama, and Georgia drilling reports are on Page 143 of this issue, and a special article on the recently opened Pickens field by Kingwood Oil Co. will be found on Page 25.

Following is the completion report for the week:

Tinsley Completions

Edgar B. Johnson's No. 1-B Brumfield, C NW SW Section 1-10-3, 864 bbl., 14/64-in. choke, Woodruff sand 4,806-15 ft., total depth 4,826 ft.

Union Producing Co.'s No. 5 Stevens, C SW NE Section 11-10-3, 444 bbl., 20/64-in. choke, Woodruff sand 4,465-4,506 ft., total depth 4,550 ft.

Union Producing Co.'s No. 6 Stevens, C SW NE Section 12-10-3, 450 bbl., 16/64-in. choke, Woodruff sand 4,810-50 ft., total depth 4,915 ft.

Union Producing Co.'s No. 8 Stevens, C NW NE Sec. 12-10-3, 460 bbl., 14/64-in. choke, Woodruff sand 4,875-4,902 ft., total depth 4,958 ft.

Dry Hole in Warren County

W. O. Allen's No. 1 J. W. Culley, 1,980 ft. NW cor., NW Sec. 6-13n-3e, top salt 4,025 ft., total depth, salt 4,490 ft., dry and abandoned.

BOOK REVIEW

**THIS FASCINATING OIL BUSINESS. By Max W. Ball, 444 pp. $2.50.*

When the roll is called up yonder of the men who have made noteworthy contributions to this fascinating oil business, Max W. Ball will be there. Oil men have for years been plagued by questions from laymen regarding the technical details of their business and have found that an answer to a simple question normally evolved into a half-hour lecture and more confusion on the part of the laymen. Men in the refining or marketing branch could not get a concise statement which would enable them to understand the producer's angle and vice versa. Textbooks abound, but busy men do not want textbooks, especially textbooks dealing with the other fellow's specialty.

Max Ball's book is far from being a textbook. It is a clear and concise account of the oil industry written in language that any layman can understand and, at the same time, in the language of the oil man himself. It deals with oil from the time when it is even less than a gleam in the geologist's eye to its final destination in the tank of your car or as a base for the cold cream on your wife's face. Throughout, the book is enlivened by a delightful humor that makes what could so easily be a pedantic volume one that will be read with delight by layman and oil man alike.

The amount of detail that the author has been able to cram into so short a space is almost as amazing as the fact that the reader never feels that facts are crowding in upon him so rapidly. The survey of the world's oil fields gives a very complete picture without a single table or chart to slow up the reader's progress. The final chapter on Oil and the War is most timely and constructive. It is a pleasure to be able to review a book which can be so highly recommended.

*"This Fascinating Oil Business" may be purchased through the Book Department of The Oil and Gas Journal at the established retail price of $2.50, postage prepaid (extra outside the United States), and a copy will be forwarded promptly upon receipt of check or money order for that sum. Where payment or company purchase order is not provided, the book will be sent c.o.d. to avoid delay.

Cardston Gas Franchise

CARDSTON, Alta.—Franco Oils, Ltd., has made application to the Cardston town council for reinstatement of its natural-gas franchise, which expired last year. The Franco company secured the franchise some years ago, but drilling started at that time has not yet developed gas production. The company has been active in sponsoring a major gas project for the city of Saskatoon, Sask.

Tanker Operators Approve New Wage Agreement

NEW YORK, Apr. 9.—Eight tanker operators in New York have entered into a new agreement with the National Maritime Union calling for a flat $5 monthly wage increase to the unlicensed personnel employed in the deck, engine and stewards' departments. The agreement expires March 31, 1942.

Companies entering the agreement are Sinclair Navigation Co., Socony-Vacuum Oil Co., Inc., Pennsylvania Shipping Co., Kellogg Steamship Co., National Bulk Carriers, Inc., Pan American Petroleum Transport Co., Commercial Molasses Corp., and BL Shipping Co. Gulf Oil Corp. was also to ratify the agreement.

There are about 10,000 unlicensed seamen employed in the tanker industry. However, the new agreement specifically applies to only 2,300 men on 69 tankers.

STATEMENT OF CONDITION MARCH 26, 1940

RESOURCES

Cash and Due from Banks	$34,281,668.27	
U. S. Government Securities	13,331,171.01	
Other Bonds and Warrants	4,274,230.07	$51,887,069.35
Loans and Discounts		18,078,539.81
Overdrafts		651.27
Income Receivable Accrued		125,778.53
Stock in Federal Reserve Bank		180,000.00
Bank Premises		3,031,668.58
Customers' Liability under Acceptances		9,530.00
TOTAL		$73,313,235.54

LIABILITIES

Deposits		$66,269,351.33
Acceptances Executed		9,530.00
Income Collected Not Earned		88,171.13
Reserve for Interest, Taxes, Etc.		14,414.80
Reserve for Preferred Dividends		5,733.42
Capital—Preferred	$ 800,000.00	
Capital—Common	2,700,000.00	
Surplus	2,500,000.00	
Undivided Profits	946,034.86	6,946,034.86
TOTAL		$73,313,235.54

NATIONAL BANK OF TULSA

The Oil Bank of America

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Personal Paragraphs

JOHN ROBBINS, of Edwards, Miss., who returned from the Netherland East Indies last fall, is being transferred to Colombia, with Petty Geophysical Co.

C. W. GEORGI has been made technical director of the research laboratory at the Emlenton refinery of Quaker State Oil Refining Corp. He was formerly chief chemist for the Enterprise Oil Co. at Buffalo.

FRANCIS HARDY, with Magnolia Petroleum Co. formerly at Sinton, Tex., has been transferred to the Alice, Tex., office where he is filling the position in the proration department formerly held by R. Y. FERGEUSON, who recently resigned.

E. R. TURNER, vice president and general manager of Pan American Production Co., was a business visitor in New York last week.

L. C. MacMORRIS, driller for Kern Trinidad Oilfields, Ltd., San Fernando, Trinidad, left New York April 2 on a motor trip through various sections of the country.

W. C. NYE, production superintendent for Cardinal Oil Co., is being transferred from Iraan, Tex., to San Angelo, Tex., where the company has moved into larger office quarters.

ALBERT B. HOCKMAN, who has been a junior engineer in the Los Angeles office of Shell Oil Co., Inc.'s field department, has been promoted to assistant engineer in the drilling department of the Coastal district and will maintain offices at Ventura.

PRESTON P. NIBLEY, a graduating petroleum-engineering senior at the University of Oklahoma, was one of eight students out of 100 applicants in the United States, winning a fellowship sponsored by Tau Beta Pi, honorary engineering fraternity.

HERBERT G. MOULTON, of New York, president of the American Institute of Mining and Metallurgical Engineers, was guest of honor at a dinner given by the Petroleum Engineers Club of the University of Oklahoma at Norman April 10. He discussed affairs of the institute and recent engineering developments at an open meeting in the university engineering building following the dinner. He was accompanied to the Southwest by A. B. PARSONS, A.I.M.M.E. secretary.

TOM COX, consulting geologist in West Central Texas and formerly located at Corpus Christi in Southwest Texas, has returned to the West Central area and is working out of Ballinger.

GEORGE H. CARD, division engineer of Stanolind Oil & Gas Co., Fort Worth, Tex., was recently appointed colonel on the governor's staff by GOV. JOHN E. MILES of New Mexico.

GLENN H. McCARTHY, drilling contractor and producer of Houston, Tex., established a new drilling record for the upper Texas Gulf Coast district by drilling below 11,700 ft. in one of his wells at the Chocolate Bayou field in Brazoria County.

BILL DONALD, Magnolia Petroleum Co., has been transferred from the Alice, Tex., district to Lovington, N. M.

RALEIGH P. COATES, formerly district superintendent Olson Drilling Co., is now with M. B. K. Drilling Co., at Midland, Tex.

REX DAWSON, of the land department, Carter Oil Co., Tulsa, addressed the Oklahoma Oil Scouts Association at Oklahoma City, Okla., last week.

ROBERT B. WING, geologist in the offices of Shell Oil Co., Inc., is being transferred to the Wichita Falls, Tex., office which carries on the company's operations in North Texas.

W. V. VIETTI, in charge of Texas Co.'s operations at Bogota, Colombia, and formerly widely known on the Gulf Coast, has been elected president of the Anglo American Club of Bogota.

PAUL WEAVER, chief geophysicist, Gulf Oil Corp., will speak on "Origin of Large Salt Deposits, Including Those in Salt Domes" before the newly organized geological society of the University of Houston, of which PHILIP ALLEN, Gulf Oil Corp., is president; E. J. MURDOCH, Shell Oil Co., Inc., vice president; JOHN KELLY, Ohio Oil Co., secretary, and RUSSELL CASEY, Woodley Petroleum Corp., treasurer.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Penn-Mex Oil Co. (South Penn subsidiary) makes its first tanker shipment of oil from Tampico. J. S. Sidwell is manager of the company.

Carl McEvoy, oil producer and Miss Nell McMahon, both of Okmulgee, Okla., were married on April 14 in Kansas City, Mo.

A pay sand below the Bartlesville is opened in the northern part of the Cushing field in Oklahoma. It has been identified as the Tucker sand.

20 YEARS AGO

Ohio Cities Gas Co. directors vote to change the name of the company to Pure Oil Co. The two companies were merged last year.

A strip of land south of the Jennings pool in Pawnee County, Oklahoma, long overlooked by oil men, is supplying gusher wells to Markham & Tidal, Roxana and other operators.

The deepest hole in Oklahoma, in Section 7-6s-19e, Choctaw County, was recently abandoned as dry at 4,970 ft.

The largest Bartlesville sand well ever drilled in the Osage Nation is in Section 20-22-10, Oklahoma. It started flowing 10,000 bbl. per day. It is owned jointly by the Phillips, Gypsy and Skelly companies.

10 YEARS AGO

Production figures for February show that Texas produced 832,668 bbl. per day; California, 745,916 bbl.; Oklahoma, 642,058 bbl., and the United States, 2,653,517 bbl.

Mid Kansas Oil & Gas Co. has bought about 7,100 acres of leases in the Cement area in Caddo County, Oklahoma, and will explore it for deep-sand production.

W. R. EDWARDS, secretary of Union Oil Co., recently completed 25 years' uninterrupted service with the company.

KEITH PATTERSON, production superintendent for Trinidad Petroleum Development Co., Ltd., Siparia, Trinidad, is in New York. He will leave for Canada in about a week.

R. R. SHINN, production superintendent of General Petroleum Corp., received a safe-driving award from the company for having driven 191,811 miles in 7 years on company business without an accident.

WAYNE MOORE, formerly scout with Stanolind Oil & Gas Co. at Mendenhall, Mo., has been transferred to Midland, Tex., where he has assumed the duties of West Texas district scout. He succeeds JACK MALLOY, who is being transferred to the company's Tulsa office.

R. S. ELLISON, president of Stanolind Crude Oil Purchasing Co. and president of the Tulsa area Boy Scout Council, announced that FRANK PHILLIPS, head of Phillips Petroleum Co., had donated $5,000 from the Frank Phillips Foundation to the council, matching $5,000 raised by scout leaders.

E. R. SHAW, personnel manager of Standard Oil Co. of Louisiana at Shreveport, La., for the past 2 years, is the new personnel manager for Carter Oil Co. at Mattoon, Ill., and is acting as liaison officer between W. A. WATKINS, Illinois division superintendent for the Carter company, and GEORGE RANDEL, superintendent of Oklahoma Pipe Line Co.

HERMAN ALBER, JR., of Gilmore Oil Co., with offices in Los Angeles, has been promoted to manager of refined oil sales.

LEE MINTER, petroleum engineer with Belmont Quadrangle Drilling Co., Bradford, Pa., has been transferred to Jackson, Miss.

E. L. TRAFFORD, general drilling superintendent, Trinidad Leaseholds, Ltd., Pointe-a-Pierre, Trinidad, will leave New York within a few days for England.

PAT HOBSON, Trinidad Consolidated Oilfields, Ltd., Fyzabad, Trinidad, is on leave in the United States and is at present visiting with friends in New Jersey.

J. H. HUFF, superintendent for the Ohio Fuel Co. in the Southwest Texas district, has resigned and is now operating as an independent with headquarters at Alice, Tex.

JOSEPH HORNBERGER, JR., in the geological department of Texas Co. at Houston, Tex., has resigned to enter business for himself, specializing in subsurface geology and well completions.

GEORGE J. O'BRIEN, formerly assistant treasurer of Standard Oil Co., who has been elected treasurer and elevated to the board of directors, succeeding V. F. PALMER who recently resigned to enter another business.

STEWART COLEMAN, of New York, has been appointed head of a new department of economics created within the Standard Oil Co. of New Jersey. Mr. Coleman was formerly with the Humble Oil & Refining Co. at Houston, Tex., having joined the holding company organization 4 or 5 years ago.

"These Are the Facts"

Discovery of oil in Nebraska a few months ago bore out a prediction made 25 years earlier by a man who has spent a lifetime studying the geology of the Cornhusker State—Dr. George E. Condra, state geologist and dean and director of the University of Nebraska conservation and survey division.

DR. GEORGE E. CONDRA

In 1914, after years studying formations underlying Kansas and Oklahoma oil fields and tracing them into Nebraska, Dr. Condra arrived at a definite theory regarding oil possibilities of his state. The next year he and an associate published a bulletin presenting reasons why oil-bearing sands should be found underlying parts of Nebraska. In succeeding years he continued to study the oil possibilities and to write, lecture, and talk about them. But he was not a promoter. He did not plead with oil men to go to Nebraska. "These are the facts," he told them. "Oil is your business, not mine."

When oil eventually was discovered at Falls City the oil men also found in the state geologist's office in Lincoln innumerable maps and complete logs of some 100 wells previously drilled in the state, along with countless pamphlets and books on Nebraska geology, prepared by Dr. Condra and his assistants.

Born in Seymour, Iowa, in 1869, Dr. Condra was educated at Western Normal College and at Iowa, Nebraska, Michigan, and Cornell universities. He has B.S., M.A., and Ph.D. degrees, and he has been state geologist since 1918.

C. E. COOPER, Los Angeles operator, has returned to his offices after 6 weeks' illness.

LOUIS W. SHANK, division manager, Tulsa, for Ethyl Gasoline Corp., has a son, Louis Warren, Jr., born March 27.

L. F. SHIPLET, district superintendent for Texas Co. in West Texas, Midland, is back in his office after a 2 months' absence due to an illness.

ROSS CHENAULT, tool pusher for Siparia Trinidad Oilfields, Ltd., Palo Seco, Siparia, Trinidad, arrived in New York and left for his home in Newtown, Va., last week.

H. T. KEMP has been appointed secretary of Anglo-Iranian Oil Co., Ltd., succeeding JOHN CLARK who retired at the end of last year. Mr. Kemp had been assistant secretary of the company since March 1935.

C. H. LYONS, independent operator of Shreveport, La., attended the Oklahoma City meeting of the Interstate Oil Compact Commission last week as unofficial representative of Gov.-designate Sam H. Jones of Louisiana.

N. P. TEAGUE, superintendent, and R. J. ST. GERMAIN and JAMES JOHNSON, of the gravity-meter department of the Standard Oil & Gas Co,. have been transferred from Houston, Tex., to Tulsa, where the department will be located.

J. D. REARDON, traffice manager of Union Oil Co., and WILLIAM O. NARRY, traffic manager of Richfield Oil Corp., were members of the executive committee of the Western Transportation Conference which was held in Los Angeles a few days ago to discuss problems of modern transportation in conjunction with University of Southern California.

SHIFTS: VAUGHN W. RUSSOM, geologist, Sinclair Prairie Oil Co., from Chickasha, Okla., to Hobart, Okla.; HENRY CARTER REA, geologist, Seaboard Oil Co., from Tuscaloosa, Ala., to Jasper, Ala.; HOWARD L. WILSON, superintendent, Power Oil & Refining Co., from Blue Island, Ill., to Centralia, Ill.; H. W. BUSH, secretary, Frontier Petroleum Corp., from Huntington, Ind., to Indianapolis, Ind.; DON O. CHAPELL, geologist, Transwestern Oil Co., from Kalamazoo, Mich., to San Antonio, Tex.; WILLIS M. DECKER, engineer, Cities Service Oil Co., from McComb, Miss., to Hattiesburg, Miss.; A. F. CORWIN, vice president, Socony-Vacuum Oil Co., Inc., from Bronxville, N. Y., to Hartsdale, N. Y.; F. N. BOSCO, engineer, from Sao Paulo, Brazil, South America, to Denver, Colo.; DEAN C. GLASS, engineer, Pure Oil Co., from Beaumont, Tex., to Van, Tex.; ROSS M. LOCKHART, Lockhart Oil Co., from San Antonio, Tex., to Alice, Tex.; C. E. McPOLAND, superintendent, Sinclair Refining Co., pipe-line department, from Miami, Fla., to Kansas City, Mo.; STANLEY W. WILCOX, Seismograph Service Corp., from Flora, Ill., to Jackson, Miss.; HERMAN AWES, Helmerich & Payne, Inc., from Salem, Ill., to Wichita Falls, Tex.; R. E. CONLEY, engineer, Pent-Hex Corp., from Grand Rapids, Mich., to Gary, Ind.; W. C. BEAN, geologist, Shell Oil Co., Inc., from Columbus, Ohio, to Tulsa; WILLIAM J. DEVANEY, engineer, Cities Service Oil Co., from Ponca City, Okla., to Bartlesville, Okla.

ROBERT C. SMITH, head of the Geological Scientific Service Co., Fort Worth, Tex., and MITCHELL TUCKER, field representative for the company, both delivered addresses on the recent developments in soil analysis before the Fort Worth Technical Club in Fort Worth, Tex., last week.

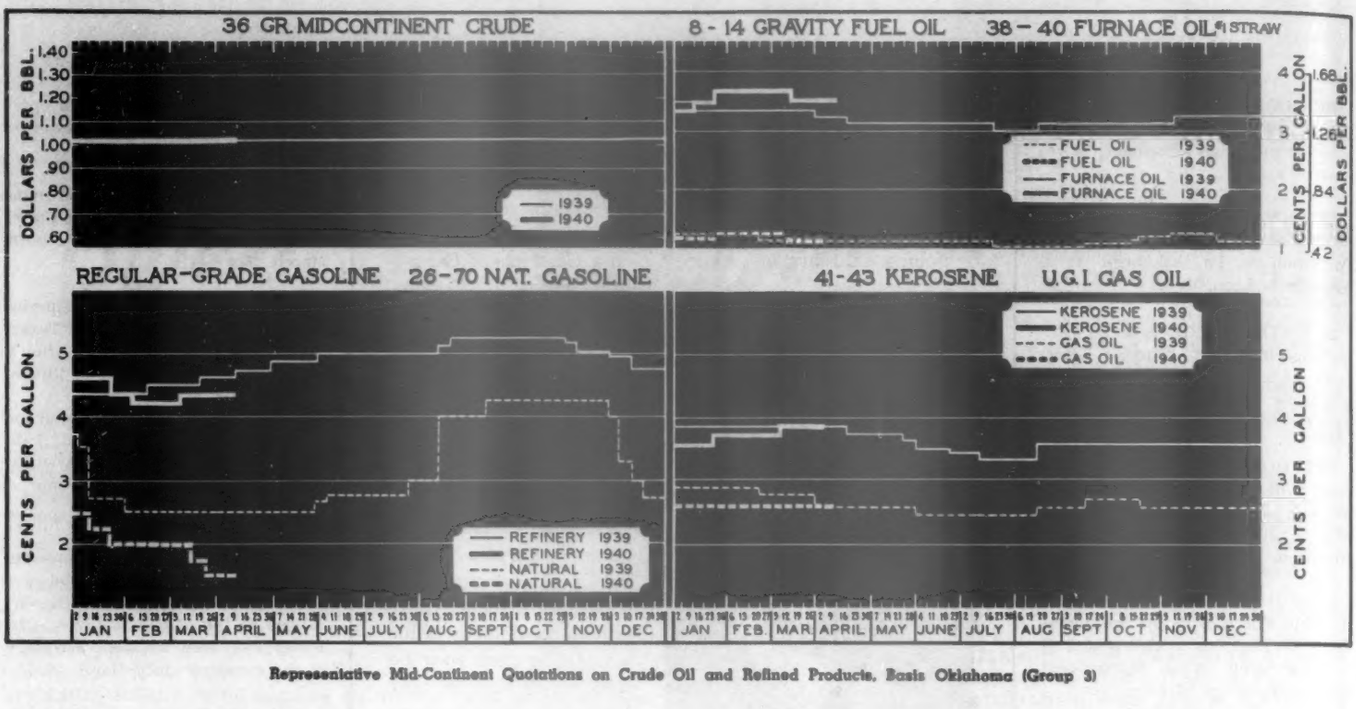
DR. WILLIAM HENRY TWENHOFEL, professor of geology at the University of Wisconsin, and M. G. CHENEY, president of the Anzac Oil Corp. and a consulting geologist in West Central Texas, have switched localities for public speaking purposes. Dr. Twenhofel will deliver a series of lectures at the A. & M. College of Texas during the week of April 15 to 20. Mr. Cheney will deliver a series of lectures to the geology departments of the University of Wisconsin while in the North attending the American Association of Petroleum Geologists meeting in Chicago this week.

R. H. CULLEN, president of Quintana Petroleum Co., Houston, Tex., has returned from an extended visit to the East Coast.

S. P. GILBERT, with Sinclair Prairie Oil Co. and formerly in the pipe-line department at the company's office in Eastland, Tex., has been transferred to the district office at Wichita Falls, Tex.

BOBBY WILSON, former All-American football player of Southern Methodist University, Dallas, Tex., and for the past 2 years employed in the field by Sun Oil Co., has been made scout in the North Texas district and will be stationed at Gainesville, Tex.

COL. J. FRANK DRAKE, president, presented service awards to 410 Pittsburgh district Gulf Oil Corp. employes with records of 10 to 35 years' service at a testimonial dinner in the William Penn Hotel, Pittsburgh, Pa., April 4. FRANK A. LEOVY, vice chairman of the board and oldest active employe to receive an award, was also awarded a "Degree of Distinguished Service." W. L. MELLON, chairman, and W. V. HARTMAN, vice president, similarly eligible, were absent.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Unpleasant Motoring Weather Helps To Keep Group 3 Market in Dumps

By T. F. SMILEY

DULLNESS overspread the Group 3 refined-oil market this week. Predictions had been made that the first of April would see higher prices for gasoline. But the opening week came and went with scarcely a flutter among quotations, which remained at ruinously low levels. Natural gasoline was desperately in need of a friendly hand. Heating oils, closing a quite satisfactory season, were displaying increased signs of softness, though holding surprisingly well. Kerosene and tractor fuels stood out from the other products through their evidences of strength, though here too prices underwent no change.

Those refiners who usually manage to preserve a semblance of cheerfulness, no matter how drab the outlook, blamed the weather man for the failure of the expected rise in gasoline to materialize. Interest in steps toward adoption of the A.S.T.M. method of determining octane numbers helped to keep minds from dwelling on disappointing aspects of the market.

Wanted—Some Pleasant Weather

"A few days of pleasant motoring weather will stimulate demand and probably start prices up," declared one of these optimists. "Even as it is, we've been sold up for 3 weeks at two of our plants, and every gallon we sell in the spot market we are buying from other refiners. I had been led to believe there was a lot of bargain-priced gasoline available, so I set out to buy 100 cars of it. I failed to uncover any substantial quantity of the underpriced material they talk about. I believe there are few really distress stocks in Oklahoma."

"It is discouraging," remarked one of the semi-major refiners, "to be obliged to sell our gasoline to contract customers at prices fixed by spot-market sales, when probably not 5 per cent of total gasoline sales are open-market transactions; and the beggarly prices at which these spot sales are made result as a rule from small refiners, with relatively small investments, competing with each other, usually in the vicinity of the newer oil fields, where crude supplies are readily obtainable, sometimes at cut prices."

Then he added as an afterthought: "Perhaps we're not entitled to any higher prices though, in view of the huge overaccumulation of gasoline the industry has built up. In every other business I know of the law of supply and demand determines prices. I don't know why we should expect to be immune from its operation."

Commenting on the same phase of the market, an independent refiner pointed out with some show of resentment that competition for spot gasoline business is not confined to small refiners. He mentioned one major company which usually buys large quantities of gasoline to supplement its own output, but which in the present overloaded market has acquired overheavy stocks at certain of its plants. In an effort to reduce these stocks it now is soliciting tank-car business in competition with the refiners from whom it formerly bought material.

In some parts of the Midwest third-grade gasoline, in demand as a tractor fuel, was exhibiting increased firmness. In the East Texas region, however, this grade of motor fuel was being sold at prices which analysts said forbade any hope of profit. Some service stations were getting 9 cents a gallon, which included 5 cents tax. That left 4 cents to be divided among the refiner, the hauler, and the dealer.

Too Much Natural Gasoline

Natural-gasoline manufacturers continued to face a situation in which supplies so far overbalanced demand that even the abnormally low prices now prevailing—the lowest in 6 years—were none too secure. The source of market weakness still centers in Texas.

Although last week's quotations for furnace oils were still holding, there was a definite slowing up in requirements. Heavy industrial fuels were exhibiting a somewhat easier tone.

Refined Oil Market Barometer

Although gasoline displayed few signs of returning strength, it generally was believed to have reached the bottom of an unsteady market in most areas. Heating oils maintaining their firmness in the East, but slowing up gradually in the interior. Natural gasoline showing no improvement. Lubricating oils weak in East, but holding in Mid-Continent. Tractor fuel and kerosene active.

MID-CONTINENT. Gasoline quiet. Naturals weak. Lubricating oils steady. Wax off.

EAST COAST. Gasoline lacks strength. Furnace oils firm. Export business disappointing.

GULF COAST. Gasoline weak, lower prices possible. Fuel oil strong. Kerosene tight.

PENNSYLVANIA. Gasoline looking slightly better. Lubricants soft. Wax unsteady.

CALIFORNIA. Gasoline moving at low prices. Fuel oil showing no improvement.

CHICAGO. Gasoline somewhat firmer. Tractor fuels active. Heavy industrial fuel off.

East Coast Motor-Fuel Market Has About Reached Bottom

By H. STANLEY NORMAN

NEW YORK, Apr. 9.—Although scattered reductions of a quarter of a cent per gallon on certain grades of motor fuel have been made since the first of April, the market in this section appears to have about reached bottom. This opinion is held by many close observers of gasoline-market conditions and is based primarily on the recent improvement in consumption reflected by comparatively mild additions to storage during the past 2 weeks, a period in which refinery operations have been raised slightly.

Inferior grades of motor fuel were lowered at New York and Boston last week, making 60-64-octane material available at both ports at around 6 cents per gallon. The better grades of gasoline were reported unchanged at most North Atlantic terminals, and scattered reports indicated the early spring consuming season is more than meeting expectations. The comparatively high consumption indications are based on scattered and incomplete reports, it is true, but the real significance is found in the trend of demand in the face of discouraging weather conditions which have prevailed over a large part of the big consuming section.

Distillate fuel oils continue to show midwinter strength. In fact, the low of the distillate fuel-oil market is at the highest point reached in years. The increased demand for diesel-engine fuel, a consumption factor of growing importance in the manufacturing and transportation industries, has prevented any improvement of the depleted stock position in which the refining branch found itself at the peak of the burning season. Then, too, operation of oil burners in this section of the country has been indispensable so far.

Kerosene-market strength has been growing in several sections of the country, particularly in New York and New England, where operation of space heaters during the period of transition from winter to summer is common practice. Kerosene and No. 1 fuel oil, practically synonymous products, are quoted to the tank-car trade in New York and North Atlantic ports at a range of 5.9 to 6.25 cents per gallon. Spot sellers of No. 2 fuel oil in New York are asking 5.4 to 5.6 cents per gallon in the tank-car market and the low for diesel fuel at this point is $2.20 per barrel, an advance of 10 cents per barrel. Many of the New York sellers are asking $2.35 per barrel for diesel fuel and report that demand is being maintained at levels beyond expectation. Some diesel oil continues to be offered at Philadelphia and Baltimore at $2.10, but even at those points the top of the market range is $2.35 and $2.25, respectively.

Reductions were reported from the western Pennsylvania refinery district at the start of last week on bright stocks, wax and dark cylinder oils. Quoted prices for bright stock were generally a cent per gallon lower than prevailed last week, and the range is currently 8 to 9 cents per gallon below the market prevailing during the final weeks of 1939 and the first part of January. Some Pennsylvania suppliers offered scale wax 0.3 to 0.4 cent per pound lower last week on the New York market, while others maintained their quotation around 5.25 cents.

Residual fuel oil was unchanged in this section. New supply contracts in most instances have been continued on the same basis as that prevailing during the first quarter of the year. Bunker C fuel oil is held in New York at $1.50 per barrel at New York, Baltimore, and Boston. One or two suppliers are selling Bunker C at Philadelphia around $1.25 per barrel, but stocks at the lower figure are strictly limited.

Tanker rates eased off slightly during the past week. Coastwise traffic is in transition from winter to summer, involving a shift from dirty to clean cargoes. Boats are reported offered for cargoes of light crude or distillate fuel oil at a range of 55 to 60 cents per barrel. Owners are asking 60 to 64 cents for heavy crude-oil cargoes from the Gulf to north-of-Hatteras.

There has been no improvement in the disappointing export business. Refiners report interest is at the lowest point in years. There is scarcely any hope of improved exports until the war assumes a different aspect. Typical of the restrictions imposed in neutral countries is the limit of approximately 8 U. S. gal. of motor fuel per car per month in Italy. This means private automobiles are limited to travel of between 120 and 160 miles per month, considerably less than a half day's crosscountry driving in the United States.

Most products on the Gulf Coast retained their market status of the preceding week. There has been a slight reaction on the top side of the higher kerosene and light fuel-oil markets with some products shaded down an eighth of a cent. The top price for cargoes of kerosene reported from the Gulf last week was 4.625, compared to a high of 4.75 cents in the previous week and a similar reduction was made on 43-47 diesel-index gas oil. Gasoline and other light fuel-oil products are unchanged from the previous week and residual fuels are quoted at a range of 90 cents to $1 for cargoes and for ships' bunkers.

The only change in retail prices reported since the general adjustment in this section between March 14 and March 25 was a lowering of the tank-wagon price on regular gasoline by Socony-Vacuum Oil Co., Inc., at Burlington, Vt. The new Burlington tank-wagon price is 13.4 cents per gallon, including 5-cent tax, compared to 14.9 cents prevailing up to March 26.

Demand for neutral oils in western Pennsylvania is reported picking up and prices which sagged from the highs established during the early months of the war have apparently leveled off and are holding the last-of-March levels without difficulty. The light lubricating-oil products are in particular favor at present because of the approach of summer.

Indications continue to multiply that the coming summer will be the heaviest tourist period in history. Predictions are based on the outlook for automobile sales, inquiries reaching established channels of highway information dispensation, and the expositions at New York and San Francisco.

A. P. I. Weekly Refinery Statistics

Week Ended April 6, 1940

	Capacity reporting (per cent)	Daily crude runs (bbl.)	Total gasoline stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Residual fuel-oil stocks (bbl.)
East Coast	100.0	530,000	21,982,000	5,306,000	7,751,000
Appalachian	91.0	112,000	3,983,000	413,000	685,000
Ind., Ill., and Ky.	88.5	503,000	18,154,000	2,322,000	3,262,000
Okla., Kans., and Mo.	76.9	262,000	8,734,000	1,014,000	1,889,000
Inland Texas	59.6	113,000	1,899,000	260,000	1,358,000
Texas Gulf	85.3	860,000	16,052,000	2,628,000	5,529,000
Louisiana Gulf	97.6	129,000	3,044,000	625,000	1,113,000
N. Louisiana and Ark.	51.5	43,000	687,000	194,000	429,000
Rocky Mountains	55.5	50,000	1,758,000	147,000	581,000
California	87.3	496,000	18,327,000	9,517,000	78,517,000
Total reported	84.9	3,098,000	94,620,000	22,426,000	101,114,000
Est. unreported	.....	357,000	7,070,000	1,125,000	3,985,000
*Est. total	.....	3,455,000	101,690,000	23,551,000	105,099,000
*Est. total previous wk.	.....	3,585,000	101,370,000	23,278,000	103,081,000
*Apr. 7, 1939	.....	3,145,000	87,189,000	25,994,000	108,968,000

*Bureau of Mines.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ended March 30, 1940	250,561,000 barrels
Week ended March 23, 1940	247,401,000 barrels
Week ended April 1, 1939	276,119,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

Gulf Coast Markets

HOUSTON, Tex., Apr. 9.—Although the season for increased motor-fuel demand is approaching, gasoline on the Gulf Coast market continued weak and no evidence of improvement was reported. Most refiners, while hoping for increased demand to start at any time now, say it is quite possible that no relief from the prevailing low prices will be felt for several weeks in view of the large oversupply of material on hand. While no further weakening of prices was reported, most sellers were of the opinion that unless buying for summer requirements starts shortly, present prices are in danger of being lowered.

Fuel oil continued its strong position and showed no signs of easing up as sellers were finding it difficult to meet requirements. Bunker C fuel was firm, and material was not too plentiful. Kerosene was extremely tight at 4⅝ cents and the supply was reported exhausted.

Retail Oil Markets

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of April 9, 1940

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline: Tank wag.	Gasoline: Dlr.	Gasoline: Incl. tax	Kero. tank wag.
Chicago, Ill.	15.1	13.1	4.0	10.0
Decatur	15.1	12.1	4.0	9.5
Joliet	15.1	13.6	4.0	10.0
Peoria	15.1	12.7	4.0	10.0
Quincy	14.9	13.4	4.0	9.8
Davenport, Ia.	15.1	13.6	4.0	‡10.0
Des Moines	14.9	12.4	4.0	‡9.8
Mason City	15.3	13.8	4.0	‡10.2
Duluth, Minn.	16.9	15.4	5.0	10.8
Mankato	16.5	15.0	5.0	10.4
Minneapolis	16.5	14.5	5.0	10.4
LaCrosse, Wis.	16.5	15.0	5.0	10.4
Green Bay	16.9	15.4	5.0	10.3
Milwaukee	16.3	14.8	5.0	10.2
Detroit, Mich.	13.6	12.1	4.0	7.6
Grand Rapids	13.2	11.7	4.0	9.0
Saginaw	14.8	13.3	4.0	9.3
Evansville, Ind.	16.6	15.1	5.0	†10.5
Indianapolis	16.8	14.3	5.0	†10.2
South Bend	16.8	15.3	5.0	†10.2
Fargo, N. D.	17.7	16.2	5.0	11.6
Huron, S. D.	17.0	15.5	5.0	10.9
Kans. City, Mo.*	14.4	12.9	4.0	8.0
St. Louis*	14.7	13.2	4.0	8.0
St. Joseph	14.4	12.0	4.0	7.9
Wichita, Kans.	13.3	11.1	4.0	7.0

*State tax 2 cents, 1-cent city tax, and 1-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices. 1,000 gal. or more, 1.5 cents off; minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective April 2, 1940, f.o.b. Chicago tank-wagon prices: Standard heater oil, 1-99 gal., 9 cents; 100-149 gal., 8 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-149 gal., 8.25 cents; 150-399 gal., 7.25 cents; 400 gal. and over, 6.75 cents. Stanolex furnace oil, 1-149 gal., 8.25 cents; 150-399 gal., 7.25 cents; 400 gal. and over, 6.75 cents. Stanolex Grade A, 1-399 gal., 5.5 cents; 400 gal. and over, 4.5 cents. Stanolex Grade B, 1-799 gal., 5.25 cents; 800 gal. and over, 4.25 cents. Stanolex Grade C, 1-999 gal., 4.5 cents; 1,000 gal. and over, 3.5 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline: Cons'r tank car wag.	Gasoline: Dlr. vided dlr.	Gasoline: Incl. tax	Kero. tank wag.
Ohio points	15.5	14.5	5.0	*13.0

*Includes state tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline: Cons'r tank car	Gasoline: Dlr. tank wag.	Gasoline: Incl. tax	Kero. tank wag.
Atl'tic City, N. J.	11.6	12.7	4.0	8.4
Newark	11.6	12.7	4.0	8.4
Annapolis, Md.	13.35	14.35	5.0	9.5
Baltimore	12.75	13.75	5.0	7.5
Cumberland	14.15	16.15	5.0	10.0
Wash'gton, D. C.	11.00	12.0	3.0	9.5
Danville, Va.	14.95	17.45	6.0	11.5
Norfolk	13.75	16.25	6.0	11.0
Petersburg	14.05	16.55	6.0	11.7
Richmond	14.05	16.55	6.0	11.0
Roanoke	15.25	17.75	6.0	11.5
Charles'n, W. Va.	14.53	17.05	6.0	12.6
Parkersburg	13.85	15.35	6.0	11.2
Wheeling	14.85	16.75	6.0	11.8
Charlotte, N. C.	16.90	18.40	7.0	11.8
Hickory	17.45	18.95	7.0	12.3
Mt. Airy	17.30	18.80	7.0	12.2
Raleigh	16.65	18.15	7.0	11.5
Salisbury	16.95	18.45	7.0	11.9
Charleston, S. C.	14.75	17.25	7.0	9.25
Columbia	15.60	18.10	7.0	11.5
Spartanburg	16.30	18.80	7.0	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryand, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery; 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

Discounts for kerosene, 1 cent off tank-wagon price for 25 gal. or more under contract (contract not necessary in Baltimore), except no discount in New Jersey.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline: Cons'r tank wag.	Gasoline: Net dlr.	Gasoline: Incl. tax	Kero. tank wag.
Atlanta, Ga.	18.0	18.0	7.0	11.0
Augusta	17.5	17.5	7.0	10.0
Macon	16.5	16.5	7.0	10.0
Savannah	16.5	16.5	7.0	9.0
Birmingham, Ala.	18.5	18.5	8.0	9.0
Mobile	18.5	18.5	9.0	8.0
Montgomery	19.5	19.5	9.0	11.0
Jackson, Miss.	16.0	16.0	7.0	10.0
Vicksburg	16.0	16.0	7.0	9.5
Jacksonville, Fla.	17.0	17.0	8.0	8.0
Miami	17.0	17.0	8.0	8.0
Pensacola	18.5	18.5	9.0	8.5
*Tampa	21.0	18.0	8.0	8.0
Lexington, Ky.	15.0	15.0	6.0	10.0
Covington	14.5	14.5	6.0	9.5
Louisville	15.5	15.5	6.0	9.0
Paducah	15.5	15.5	6.0	9.0

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

*Temporary discounts to tank-wagon consumers in Tampa 3 cents per gallon below consumer tank-wagon price on Crown gasoline.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline: Cons'r tank car	Gasoline: Dlr. tank wag.	Gasoline: Incl. tax	Kero. tank wag.
Albany	12.1	14.1	5.0	8.3
*Met. N. Y.: Manhat., Bronx, Queens, Brklyn., Staten Island	12.2	13.3	5.0	8.5
Buffalo	12.6	14.5	5.0	7.9
Rochester	12.8	14.8	5.0	8.5
Syracuse	12.7	14.5	5.0	8.8
Portland, Me.	12.1	14.1	5.0	8.5
Manchester, N.H.	12.7	14.5	5.0	8.9
Burlington, Vt.	12.6	13.4	5.0	8.7
Boston, Mass.	11.0	12.5	4.0	8.5
Worcester	11.6	13.1	4.0	8.0
Hartford, Conn.	11.4	13.3	4.0	8.4
New Haven	11.3	12.3	4.0	7.5
Providence, R. I.	11.0	13.0	4.0	8.5

*Does not include 2 per cent city sales tax, which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Effective February 15, 1939, the company changed its commercial consumer policy in New York and in New England points for tank-wagon delivery to the following: Annual purchases 10,000 gal. and under, tank-car price plus 2 cents per gallon; annual purchases 10,000 gal. up to 50,000 gal., tank-car price plus 1.5 cents per gallon; annual purchases 50,000 to 200,000 gal., tank-car price plus 1 cent per gallon; annual purchases 200,000 gal. and over, tank-car price plus ½ cent per gallon. Private consumers pay undivided dealer price, plus 2 cents per gallon. Private consumers receiving full compartment deliveries of at least 200 gal. receive a discount of ⅛ cent per gallon.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline: Cons'r tank car	Gasoline: Dlr. tank wag.	Gasoline: Incl. tax	Kero. tank wag.
Philadelphia, Pa.	12.0	13.5	5.0	10.5
Pittsburgh	13.0	14.5	5.0	10.5
Allentown	13.0	14.5	5.0	10.5
Erie	13.0	14.5	5.0	10.0
Scranton*	12.5	15.0	5.0	10.5
Altoona	13.0	15.0	5.0	10.5
Dover, Del.		13.5	5.0	10.5
Wilmington		13.5	5.0	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

*Voluntary discount of 1 cent allowed to dealers only.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline: Tank truck	Gasoline: Serv. sta.	Gasoline: Incl. tax	Kero. tank wag.
San Francisco	17.5	18.5	4.0	11.5
Los Angeles	17.0	18.0	4.0	10.0
Fresno, Calif.	18.5	19.5	4.0	12.5
Phoenix, Ariz.	20.0	21.0	6.0	*17.5
Reno, Nev.	20.5	21.5	5.0	13.5
Portland, Ore.	20.0	21.0	6.0	13.5
Seattle, Wash.	20.0	21.0	6.0	†13.75
Spokane	21.5	22.5	6.0	†16.75
Tacoma	20.0	21.0	6.0	†13.75

*Includes 5-cent state tax. †Includes 0.25-cent state tax.

Discounts to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline: Tank wag.	Gasoline: Dlr.	Gasoline: Incl. tax	Kero. tank wag.
Denver, Colo.	13.0	...	5.0	10 5
Grand Junction	17.5	...	5.0	12.5
Pueblo	13.0	...	5.0	9.0
Casper, Wyo.	16.5	...	5.0	11.5
Cheyenne	14.0	...	5.0	11.0
Billings, Mont.	18.0	...	6.0	12.0
Butte	18.0	...	6.0	13.0
Great Falls	18.0	...	6.0	12.0
Helena	18.5	...	6.0	12.5
Salt Lake, Utah	15.5	15.5	5.0	14.0
Boise, Idaho	21.1	21.1	6.0	16.0
Twin Falls	21.1	21.1	6.0	16.5
Albu'que, N. M.	13.5	...	6.5	10.0
Roswell	16.0	16.0	6.5	8.0
Santa Fe	17.5	17.5	6.5	10.0

*Includes city tax of 0.5 cent. †Includes state tax of 1 mill.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline: Cons'r tank car	Gasoline: Dlr. tank wag.	Gasoline: Incl. tax	Kero. tank wag.
New Orleans, La.	14.75	17.25	8.0	†11.0
Baton Rouge	14.75	17.25	8.0	‡10.5
Alexandria	14.75	17.25	8.0	‡10.5
Lafayette	15.00	17.50	8.0	‡10.0
Lake Charles	14.75	17.25	8.0	‡12.5
Shreveport	13.50	16.00	8.0	‡9.0
Knoxville, Tenn.	18.00	19.50	8.0	12.5
Memphis	16.00	17.50	8.0	11.0
Chattanooga	17.50	19.00	8.0	12.0
Nashville	17.00	18.50	8.0	11.5
Bristol	18.25	17.75	8.0	12.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

†Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 60 gal., consumer tank car plus 2 cents per gallon 50 to 193 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline: Tank wag.	Gasoline: Dlr.	Gasoline: Incl. tax	Kero. tank wag.
Texarkana, Ark.	13.0	...	5.0	7.0
Fort Smith	14.5	...	5.0	7.5
Little Rock	16.75	...	7.5	8.0
Muskogee, Okla.	13.0	12.0	5.0	7.0
Oklahoma City	11.0	10.0	5.0	6.5
Tulsa	11.0	...	5.0	6.0

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline: Tank wag.	Gasoline: Dlr.	Gasoline: Incl. tax	Kero. tank wag.
Omaha	16.5	13.5	6.0	9.5
McCook	16.5	13.4	6.0	9.0
Norfolk	16.5	14.4	6.0	9.5
North Platte	17.8	14.9	6.0	10.0
Scottsbluff	18.5	15.5	6.0	10.0

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline: Tank wag.	Gasoline: Dlr.	Gasoline: Incl. tax	Kero. tank wag.
Dallas, Tex.	12.0	16.0	5.0	7.0
Fort Worth	12.0	16.0	5.0	8.0
Houston	13.5	17.5	5.0	7.9
San Antonio	13.0	17.5	5.0	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada*

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Tank wag.	Incl. tax	Kero. tank wag.
Halifax, N. S.	25.0	10.0	19.0
St. John, N. B.	25.0	10.0	19.0
Montreal, Que.	24.0	8.0	16.5
Toronto, Ont.	23.5	8.0	16.0
Hamilton, Ont.	23.5	8.0	16.0
Winnipeg, Man.	26.5	7.0	20.5
Brandon, Man.	28.0	7.0	22.0
Regina, Sask.	25.5	7.0	20.5
Saskatoon, Sask.	28.0	7.0	23.0
Edmonton, Alta.	25.9	7.0	20.J
Calgary, Alta.	25.0	7.0	18.(
Vancouver, B. C.	25.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent be low tank-wagon price. In maritime provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Standard Oil Co. of Nebraska March 21 reduced dealer gasoline 0.5 cent in McCook.

Standard Oil Co. (Kentucky) March 26 reduced consumer tank-wagon and net dealer gasoline 1.5 cents in Macon; March 30, reduced consumer tank-wagon and net dealer gasoline 0.5 cent in Vicksburg; March 28, advanced tank-wagon kerosene 1 cent in Atlanta.

Continental Oil Co. March 27 reduced tank-wagon and dealer gasoline 1½ cents in Cheyenne.

Socony-Vacuum Oil Co., Inc., March 26 reduced dealer tank-wagon gasoline 1.4 cents in Burlington.

Prices of Refined Products

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of April 9, 1940

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 octane and below	.03½	.03⅝
63-66 octane	.03⅝	.03¾
67-69 octane	.04	.04⅛
70-72 octane (regular)	.04⅛	.04¼
60-62 400 grades:		
62 octane and below	.03⅝	.03¾
63-66 octane	.03¾	.04
67-69 octane	.04¼	.04¼
70-72 octane (regular)	.04⅜	.04½
68-70 360	.04½	.04⅝

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below	.03½	.03⅝
63-66 octane	.03⅝	.03¾
67-69 octane	.04	.04⅛
70-72 octane (regular)	.04⅜	.04½
60-62 400	.03⅝	.03¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
62 octane and below	.04⅛	.04¼
63-66 octane	.04⅜	.04½
70-72 octane (regular)	.04⅞	.05

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
62 octane and below		.04
70-72 octane (regular)		.05

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.03¾	.04
63-66 octane	.04	.04⅛
67-69 octane	.04¼	.04⅛
70-72 octane (regular)	.04½	.04⅝
60-62 400 grades:		
62 octane and below	.03¾	.04
63-66 octane	.04	.04⅛
67-69 octane	.04¼	.04½
70-72 octane (regular)	.04½	.04⅝
68-70 360	.04⅝	.04⅞

PENNSYLVANIA (Inland refineries)—

58-62 U. S. Motor		.05
72-74 octane (regular)	.06	.06¼

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.05¾	.07
58-60 400, 65 oct. and higher	.07	.08

EAST COAST (domestic)—

U. S. Motor, 65 and above:		
*New York (Bayonne)	.060	.0680
Philadelphia	.060	.0625
Boston	.065	.0675
Baltimore	.060	.0650
Charleston, S. C.	.065	.0675

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
65-67 octane	.04⅝	.04¾
68-70 octane	.04¾	.05
70-72 octane (leaded)	.05	.05⅛

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.01⅛
Grade 18-55	.01⅝	.01⅞

NORTH TEXAS—

Grade 26-70		.01¼
Grade 18-55		.01½

CALIFORNIA—

75-85 375-390	.05¾	.06

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.01⅝

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p., 110-flash, 540-550 e.p.	.03¾	.03⅞
41-43 gr., 300-320 i.b.p., 110-125 flash, 500-520 e.p.	.03⅝	.03⅞
46-48 gr., 210-230 i.b.p., 480-max. e.p.		.04⅛

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43		.03⅞
42-44		.04

NORTH TEXAS—

41-43	.03¾	.03⅞

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43		.04⅛

ARKANSAS (Ark. and N. La. del.)—

41-43		.03⅞

PENNSYLVANIA (Inland refineries)—

45	.04⅞	.05
46	.05	.05⅛
47	.05⅛	.05¼

CHICAGO (Based on Group 3)—

41-43	.03⅞	.04
42-44	.04	.04⅛

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04½	.05¾

NEW YORK (Bayonne, N. J.)—

41-43	.059	.065

GULF COAST (domestic)—

41-43	.04½	.04⅝

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03¾	.03⅞
No. 1 prime white, 38-42	.03⅝	.03¾
No. 1 straw, 38-40	.03½	.03⅝
No. 2 straw, 32-36	.03⅝	.03½
No. 2 dark, 32-36	.03¼	.03⅜
No. 3 zero to 10, 28-32		.03¼
No. 3, 15 and above, 28-32	.02⅝	.02⅞

NORTH TEXAS—

No. 1 prime white, 38-42	.03¾	.03⅞
No. 1 straw, 38-40	.03⅝	.03¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03	.03⅛

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36		.03⅝

CHICAGO (Based on Group 3)—

Range oil	.03¾	.03⅞
No. 1 prime white, 38-40	.03⅝	.03⅞
No. 1 straw, 38-40	.03⅛	.03⅜
No. 2 straw, 32-36	.03⅝	.03½
No. 2 dark, 32-36	.03¼	.03⅜
No. 3, zero to 15, 28-32	.03¼	.03⅜
No. 3, 15 and above, 28-32	.02⅝	.02⅞

NEW YORK (Bayonne, N. J.)—

*No. 1	.059	.065
*No. 2	.054	.056
*No. 4	.054	.056

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35	.02⅝	.02¾
No. 5, low pour point, 18-22	.72½	.77½
No. 6, 15 and above, 8-14	.45	.50

NORTH TEXAS—

U.G.I. gas oil, under 35	.02⅝	.02¾
No. 5, low pour point, 18-22	.72½	.77½
No. 6, 15 and above, 8-14	.45	.50

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.70	.75

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02⅝	.02⅞
No. 5, low pour point, 18-22	.75	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pour point, 10-16	.60	.70
No. 6, 15 and above, 10-16	.45	.55

PENNSYLVANIA (Inland refineries)—

36-40	.03⅞	.04

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.15	1.25
24 plus diesel, per bbl.	1.15	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.65	.75
10-16 (cargo lots)	.65	.75
12-17 (tank cars)	.60	.75
10-17 (high sulfur)	.50	.65
San Joaquin Valley:		
10-18 (tank cars)	.50	.70
24 plus diesel, per bbl.	1.15	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.80	.85

GULF COAST—

No. 2 fuel		.04⅛
43-47 diesel		.04
48-52 diesel		.04⅛
53-57 diesel		.04½
58-and-above diesel		.04⅝
Bunker C (bulk cargoes)	.90	1.00
Bunker C (bunkers)	.90	1.00

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil	.054	.056
28-30 diesel (lighterage 6¼c per bbl.)	2.20	2.35
28-30 diesel (tank cars)	.05	.056
Bunker C (to ocean-going ships in N. Y. Harbor)		1.50
Industrial fuel (tank cars)	.035	.04

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.26
150-160 D, 0-10		.22
150-160 D, 10-25		.21
100-110 D, 0-10		.21
100-110 D, 10-25		.20
Steam refined:		
600 dark green (untreated)		.07½

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.25½
15 pour point		.24½
25 pour point		.23
Steam refined:		
600	.13	.14
650	.15	.16
600 flash	.17	.18
630 flash	.18	.19

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.11½
180-3		.12⅛
180-4		.12
200-3		.13
200-4		.12½
250-3		.14½
250-4		.14
280-3		.15½
280-4		.15
300-3½		.16
400-3½		.17
100-2½ paraffin oil		.07
10-25 pour point:		
200-3		.12½
200-4		.12
250-3		.14
250-4		.13½
280-3		.15
280-4		.14½

GULF COAST—

Pale oils:		
200-3	.07¼	.07½
300-3	.07¾	.08
500-3½	.08½	.09
750-3½	.09	.09½
1,200-3½	.09¾	.10
2,000-4		.10¼
Red oils:		
200-5-6	.07	.07¼
300-5-6	.07½	.07¾
500-5-6	.08¼	.08¾
750	.08¾	.09¼
1,200-5-6	.09¾	.09¾

CALIFORNIA (moving to dom. market)—

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	07¼	.08
350-5-6	.09¼	.11¼
400-5-6	.09¼	.11¼
450-5-6	.09¼	.11¼
500-5-6	.09¼	.11¼
600-5-6½	.09¼	.11¼
700-6½ plus	.09¼	.11¼
750-6½ plus	.09¼	.11¼
900-6½ plus	.09¾	.11¼

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		.26½
10 pour point		.25½
15 pour point		.24½
25 pour point	.23	.24
200 vis. at 70° F., 3 color:		
Zero pour point		.28½
10 pour point		.27½
15 pour point		.26½
25 pour point	.25	.26

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.05	.05⅛

PENNSYLVANIA (Inland refineries)—

122-124 (A.m.p.) w.c. scale	.04⅞	.05
124-126 (A.m.p.) w.c. scale	.04⅞	.05

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax	.062	.063
128-130 (A.m.p.) wax	.062	.064
130-132 (A.m.p.) wax	.063	.066
133-135 (A.m.p.) wax	.065	.068
135-137 (A.m.p.) wax	.067	.069
Crude scale:		
124-126 (A.m.p.) w.s.	.0485	.0525
124-126 (A.m.p.) y.s.	.0485	.0525
Petrolatum in barrels, carload lots:		
Dark green	.03125	.03375
Amber	.03375	.03625
Extra amber	.03625	.03875
Lily white	.05875	.06000
Snow white	.06875	.07000
Cream	.04875	.05000

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.05	.05⅝
60-62 400	.05¼	.06¼
61-63 390	.05¼	.06¼
64-66 375	.05⅝	.06¼

LOS ANGELES—

U. S. Motor grades:		
60-65 octane	.05½	.05⅝
65-69 octane	.05⅝	.06¼
Above 69 octane	.06¼	.06⅝

KEROSENE

GULF COAST—

41-43 water white	.04¾	.05¼

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.o.s. in bbl.)—

Cylinder stocks:		
600 S.R. unfiltered	.21	.23
630 S.R. unfiltered	.23	.25
600 flash, S.R.	.24	.26
630 flash, S.R.	.28	.29
Bright stock:		
Light, 25 pour point	.31	.32½

NEUTRAL OIL

200-3 color	.32	.33
150-3 color	.31	.35

PARAFFIN WAX

NEW YORK (prices per pound)—

123-125 A.m.p.		.07⅛
125-127 A.m.p.		.07⅛
128-130 A.m.p.		.07½
133-135 A.m.p.		.08⅛
135-137 A.m.p.		.08⅝
Crude scale:		
124-126 w.s.	.0485	.0525
124-126 y.s.	.0485	.0525

Crude Oil Prices

Oklahoma, Kansas, North Central and East Central Texas

East Texas (Oct. 11, 1938)* . . . $1.10
Sinclair Prairie Oil Marketing Co. October 2, 1939. DeSoto Pipe Line October 2, 1939. Cities Service Co. October 5, 1939. Shell Oil, Inc., October 5, 1939.
Van, Tex. (Oct. 11, 1938)* $0.93
Talco, Tex. (Oct. 2, 1939)* 65
Rodessa, Tex.
See North Louisiana gravity schedule
Cass and Panola counties, Texas . . . .
See note below
Altus and Tipton† . . . . . See note below
Cayuga, Tex. (Oct. 2, 1939) $0.78
Clay Creek, Tex. 85
Long Lake, Tex. (Jan. 20, 1940) . . . 1.08

*Humble Oil & Refining Co. †Gulf Refining Co. Pure Oil Co.'s Van price, 93 cents, effective Oct. 13, 1938.

Cass and Panola counties, Texas, effective October 12, 1938, by Magnolia Petroleum Co., same as North Louisiana prices in Column 5 gravity schedule.

Altus and Tipton, Oklahoma, starting at below 25° at 71 cents, 2-cent spread to 40° and above at $1.03. Cayuga posted by Pan American Pipe Line Co. Clay Creek by Sun Oil Co. Long Lake by Sinclair Oil Marketing Co.

West Texas

See gravity table.
Fisher County, Texas (Apr. 1, 1939)
See note below
Pecos County (Oct. 11, 1938)* $0.78
Pecos shallow (Oct. 11, 1938)† 65

*Shell Oil Co., Gulf Pipe Line Co. and Humble Oil & Refining Co. †Shell Oil Co.

Fisher County, Texas, by Shell Oil Co., Inc., below 25°, 68 cents; 25°, 70 cents, with 2-cent spread to 40° and over at $1.

North Louisiana and Arkansas

Shreveport, La. (Sept. 7, 1939) . . . $1.05
See note below
Smackover, Ark. (Oct. 5, 1938)* 73
Buckner, Magnolia, and Village, Ark. (Oct. 5, 1938)* . . . . . See note below
Schuler, Jones sand (Sept. 13, 1939) .79
Schuler, Reynolds sand (Sept. 13, 1939) 91
Tullos and Urania 89
Cotton Valley, La. (distillate) (Dec. 23, 1938)* 1.20
Cotton Valley (Holloway sand) Dec. 16, 1939) 1.00
Lisbon, La. (Apr. 29, 1939) . . . . .
See note below
Atlanta, Ark. (Sept. 13, 1939) 93
Magnolia, Ark. (Sept. 13, 1939) 93
Dorcheat, Ark. (Feb. 10, 1940) 1.00
University, La. (Sept. 11, 1939) . . .
See note below

*Smackover posted by Standard Oil Co. of Louisiana, Oct. 5, 1938; by Magnolia Petroleum Co., Oct. 12; by Gulf Refining Co., Oct. 13; McMillan Refining Co. and Cross Refining Co. met price. Tullos and Urania posted by Hunt Oil Co. and Arkansas Fuel Oil Co.

The above Schuler, Atlanta, and Magnolia, Arkansas, flat prices posted by Lion Oil Refining Co. Shreveport flat prices posted by Caddo Crude Oil Purchasing Co. and Atlas Oil Corp.

Buckner, Magnolia, and Village, Arkansas prices effective Sept. 13, 1939, by Standard Oil Co. of Louisiana, start at below 25° at 63 cents, with 2 cents added for each degree up to 40 and over at 95 cents.

Effective Sept. 7, 1939, Standard Oil Co. of Louisiana posted gravity prices in Shreveport field beginning at below 25°, 73 cents; 25-25.9°, 75 cents, with 2 cents added for each degree up to 40 and over at $1.05. Dorcheat posted by Standard of Louisiana.

In the Lisbon, Louisiana, field, effective Sept. 14, 1939, Gulf Refining Co. and Caddo Crude Oil Purchasing Co. posted 27-27.9°, 66 cents, with 2 cents added for each degree up to 35 and over at 82 cents.

In the Baton Rouge (University) field, Louisiana, effective Sept. 11, 1939, Standard Oil Co. of Louisiana posted below 20° 79 cents, with 3 cents added for each degree upward to 26-26.9° at $1, and then 2 cents added for each degree up to 40 and over at $1.28. Posting discontinued Mar. 14, 1940.

Southwest Texas

Salt Creek, Darst Creek, Hilbig, Carroll, Clark and Zoboroski (Oct. 11, 1938)* $0.96
Pettus (Oct. 11, 1938)* 1.29
Flour Bluff (Dec. 3, 1938)* 1.23
Jim Wells County (Oct. 2, 1939)* . . 1.23
Darst Creek (Oct. 12, 1938)† 96
Darst Creek and Bruner (Oct. 13, 1938)‡ 96
Luling (Oct. 12, 1938)† 87
Lytton Springs (Oct. 12, 1938)† 99
Mirando (Oct. 12, 1938)† . . . . . .
Government Wells (Oct. 13, 1938) . . .
See note below

*Humble Oil & Refining Co. †Magnolia Petroleum Co. Pettus price adopted by Atlantic Crude Oil Purchasing Co. ‡Gulf Refining Co.

Government Wells posted by Sun Oil Co. starts at 20° at 77 cents, 3-cent spread to 24°-24.9° at 89 cents.

Gulf Coast

Sea Breeze, Willow Slough, and LaBelle, Tex. (Sept. 14, 1939)*** $1.10
Conroe, Tex. (Oct. 11, 1938)* 1.27
Black Bayou and White Castle, La. (Oct. 11, 1938)† . . . . . See note below
Gibson, La. (Oct. 11, 1938)† $1.04
Garden Island, La. (Oct. 12, 1938)‡. 1.24
Lafitte, La. (Oct. 12, 1938)‡ 1.04
Cleveland, Tex. (Oct. 12, 1938)¶ 1.14
Schwab, Polk County (Feb. 20, 1939) 1.00
Hardin, Tex. (Sept. 14, 1939)* 1.10
Tepetate, La. (Oct. 11, 1938)§ 1.03
Villa Platte, La. (Oct. 11, 1938)§ 1.03
Abbeville, La. (Jan. 1, 1939)§ . . . . .
See note below
Bosco, La. (Dec. 3, 1938)‖ $0.93
Creole, La. (Oct. 13, 1938)‖ 96
Gueydan, Sweet Lake, and Louise, La. (Oct. 13, 1938)‖ . . . . See note below
Vinton, Edgerly, Starks, Hackberry, Timbalier Bay, Quarantine Bay, and Grand Bay, La. (Oct. 2, 1939)**
Segno and Wing (Oct. 2, 1939)**
See note below
Livingston (Oct. 11, 1938)† $1.10
Happytown, La. (Jan. 12, 1940)† . . 1.00

*Humble Oil & Refining Co. †Shell Oil Co., Inc., ‡Texas Co. §Continental Oil Co. ‖Pure Oil Co. ¶Magnolia Petroleum Co. **Gulf Refining Co. ***Sun Oil Co. Hardin prices by Humble and Sun companies.

Black Bayou, etc., starts at below 20° at 79 cents; 20°-20.9°, 81 cents; 21°-21.9°, 83 cents; then a 3-cent spread to 26°-26.9°, 98 cents; then a 2-cent spread to 40° and over at $1.14. Abbeville starts at below 36°, 92 cents, 2-cent spread to 40° and over at $1.02. Gueydan, etc., starts below 20°, 79 cents, 3-cent spread to 26°-26.9° at $1, and 2-cent spread to 40° and over at $1.28. Segno and Wing take Gulf Refining Co.'s Gulf Coast prices. Vinton, Edgerly, etc., schedule starts at below 20°, 86 cents, 2-cent spread to 34° and above at $1.16. Schwab posted by Shell Oil Co., Inc.

Hackberry, East and West, effective October 2, 1939, by Stanolind Oil & Gas Co. Below 20 gravity 86 cents, 2 cents added for each degree up to 34° and over at $1.16.

Crude Prices by Gravities

Gravity—	Oklahoma and Kansas 1	Oklahoma and Kansas 2	Oklahoma and Kansas 3	North and Central Texas 4	Louisiana and Arkansas 5	East Central Texas 6	Gray County, Texas 7	Carson and Hutchinson Counties, Texas 8	West Texas, and Lea County, N. M. 9	Raccoon, Satsuma, and Tomball, Texas 10	Gulf Coast 11	Anahuac, Dickinson, Texas 12	Refugio, Texas 13	Mirando-Duval, Beaumont-West Beaumont, Texas 14	Golden Meadow, Louisiana 15	Lockport, Iowa, Cameron Meadows, Louisiana 16	Bunkie and Eola, Louisiana 17	Artesia, Jackson, Maljamar, N. M. 18
Below 18																$.74		
18-18.9									$.53							.76		
19-19.9									.53		$.86	$.81	$.91	$.86		.78		
20-20.9	$.70		$.60						.55		.88	.83	.93	.88		.80		
21-21.9	.72		.63						.57		.90	.85	.95	.90		.82		
22-22.9	.74		.66						.59	$.95	.92	.87	.97	.92		.85		
23-23.9	.76		.69			$.78			.61	.97	.94	.89	.99	.94		.88		
24-24.9	.78		.72	$.71	$.73	.80			.63	.99	.96	.91	1.01	.96	$.90	.91		
Below 25																	$.83	
25-25.9	.80	$.58	.75	.73	.75	.82			.65	1.01	.98	.93	1.03	.98	.90	.94	.85	
26-26.9	.82	.63	.78	.75	.77	.84			.67	1.03	1.00	.95	1.05	1.00	.90	.97	.87	
27-27.9	.84	.68	.81	.77	.79	.86			.69	1.05	1.02	.97	1.07	1.02	.90	.99	.89	
28-28.9	.86	.73	.84	.79	.81	.88	$.72	$.67	.71	1.07	1.04	.99	1.09	1.04	.90	1.01	.91	$.61
29-29.9	.88	.78	.87	.81	.83	.90	.74	.69	.73	1.09	1.06	1.01	1.11	1.06	.90	1.03	.93	.63
30-30.9	.90	.82	.90	.83	.85	.92	.76	.71	.75	1.11	1.08	1.03	1.13	1.08	.90	1.05	.95	.65
31-31.9	.92	.86	.92	.85	.87	.94	.78	.73	.77	1.13	1.10	1.05	1.15	1.10	.92	1.07	.97	.67
32-32.9	.94	.90	.94	.87	.89	.96	.80	.75	.79	1.15	1.12	1.07	1.17	1.12	.94	1.09	.99	.69
33-33.9	.96	.96	.96	.89	.91	.98	.82	.77	.81	1.17	1.14	1.09	1.19	1.14	.96	1.11	1.01	.71
34-34.9	.98	.98	.98	.91	.93	1.00	.84	.79	.83	1.19	1.16	1.11	1.21	1.16	.98	1.13	1.03	.73
35-35.9	1.00	1.00	1.00	.93	.95	1.02	.86	.81	.85	1.21	1.18	1.13	1.23	1.18	1.00	....	1.05	.75
36-36.9	1.02	1.02	1.02	.95	.97	1.04	.88	.83	.87	1.23	1.20	1.15	1.25	1.20	1.02	....	1.07	.77
37-37.9	1.04	1.04	1.04	.97	.99	1.06	.90	.85	.89	1.25	1.22	1.17	1.27	1.22	1.04	....	1.09	.79
38-38.9	1.06	1.06	1.06	.99	1.01	1.08	.92	.87	.91	1.27	1.24	1.19	1.29	1.24	1.06	....	1.11	.81
39-39.9	1.08	1.08	1.08	1.01	1.03	1.10	.94	.89	.93	1.29	1.26	1.21	1.31	1.26	1.08	....	1.13	.83
40 and over	1.10	1.10	1.10	1.03	1.05	1.12	.96	.91	.95	1.31	1.28	1.23	1.33	1.28	1.10	....	1.15	.85

Column 1—Effective October 17, 1938, by Standard Oil Co. of Indiana. By Gulf Refining Co., October 13, 1938. Carter Oil Co. schedule and prices same from 30° upward, but on lower gravities pays below 21° 60 cents, with 3 cents added for each degree up to and including 29-29.9°, effective October 13, 1938. Gulf Oil Corp. starts at below 25° 78 cents, October 13, 1938. Texas Co. schedule starts at 28-28.9° at 86 cents. Pure Oil Co. same as Standard of Indiana's schedule, effective October 14, 1938.

Column 2—Sinclair Prairie Oil Marketing Co. February 16, 1939.

Column 3—Magnolia Petroleum Co. effective October 12, 1938; Shell Petroleum Corp., October 22, 1938; Shell Oil Co., Inc., April 1, 1939.

Column 4—Effective December 3, 1938, by Humble Oil & Refining Co. in Central Texas. By Magnolia Petroleum Co. in East Central and in North and Central Texas, excepting that it starts at below 29° at 79 cents, effective December 3, 1938. Texas Co. in North and Central Texas, same as Magnolia's but effective October 12, 1938. Gulf Refining Co. same as Magnolia's, effective October 13, 1938. Sinclair Prairie Oil Marketing Co. same as Magnolia's, effective October 5, 1939. Stanolind Oil Purchasing Co., in Cooke and Montague counties, schedule starts at below 21°, 60 cents, with a 2-cent spread upward to 40° and over at $1, effective October 17, 1938.

Column 5—Standard Oil Co. of Louisiana, effective October 5, 1938. Met by Gulf Refining Co. October 13; met by Texas Co. October 12.

Column 6—Humble Oil & Refining Co., October 11, 1938.

Column 7—Humble Oil & Refining Co., effective December 3, 1938. Sinclair Prairie Oil Marketing Co., October 11, 1938. Texas Co. quotes "Panhandle sweet crude," beginning with 34-34.9°, at 84 cents, with 2-cent spread to 40° and over at 96 cents, and "Panhandle sour crude," 79 cents for 34-34.9°, with a top of 91 cents for 40° and over, effective October 12. Magnolia Petroleum Co. met Humble prices throughout, effective December 3. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29°, 72 cents with a 2-cent spread, and a top price of 96 cents for 40° and above, and "Panhandle sour crude" below 29°, 67 cents, with a top of 91 cents for 40° and above effective October 13. Phillips Petroleum Co. schedule for sweet crude in Gray, Carson, and Hutchinson counties, starts at below 29°, 72 cents, with a spread of 2 cents up to 96 cents for 40° and over, effective February 7, 1939.

Column 8—Humble Oil & Refining Co., effective December 3, 1938. Sinclair Prairie Oil Marketing Co., October 11, 1938. Texas Co. quotes "Panhandle sweet crude" at 34-34.9°, 84 cents, with a top of 96 cents for 40 gravity, and "Panhandle sour crude" at 34-34.9°, 79 cents, with a top of 91 cents for 40° and over, effective October 12. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29°, 72 cents, with a top of 96 cents for 40° and over and "Panhandle sour crude" at below 29°, 67 cents, with a top of 91 cents for 40° and above, effective October 13. Phillips Petroleum Co. schedule for sour crude in Carson, Moore, and Hutchinson counties, starts at below 29° at 67 cents, with a spread of 2 cents up to 91 cents for 40° and over, effective February 7, 1939.

Column 9—Humble Oil & Refining Co., effective October 11, 1938. Texas Co. schedule starts at below 26°, 65 cents, and ends at 36° and over at 87 cents, effective October 12. Gulf Refining Co. starts at below 26° at 65 cents and ends at 40° and over at 95 cents, effective October 13. Magnolia Petroleum Co. schedule starts below 25°, 63 cents, and ends at 40° and above at 95 cents, effective October 12. Sinclair Prairie Oil Marketing Co. schedule same as that of Magnolia, effective October 11, but revised on March 24, 1939, to stop at 36° and over at 87 cents. Stanolind Oil Purchasing Co. schedule same as that of Humble, effective October 11. Stanolind Oil & Gas Co. (Winkler County) starts at below 26°, 65 cents, with a 2-cent spread, and a top of 95 cents for 40° and above, effective October 11, 1938. Effective September 1, 1939, Shell Oil Co., Inc., posted Yoakum County crude, starting at below 20°, 53 cents, with 2 cents added for each degree up to 36° and over at 87 cents. Effective March 31 Atlantic Refining Co. added Gaines County to its price schedule.

Column 10—Humble Oil & Refining Co., effective October 11. 1938. Magnolia Petroleum Co., in Tomball, effective October 12.

Column 11—Effective October 2, 1939, by Humble Oil & Refining Co. in Texas Coast. By Sinclair Prairie Oil Marketing Co. in Texas Coast, October 3, 1939. By Texas Co. at $1.16 in Texas and Louisiana Coast, October 2, 1939, schedule stopping at 34° and over. By Sun Oil Co. in Texas and Louisiana Coast, October 2, 1939. By Gulf Refining Co. in Louisiana October 2, 1939, excepting that schedule stops at $1.16 for 34° and above. By Gulf Refining Co. in Texas, effective November 1, 1939.

Column 12—Effective by Humble Oil & Refining Co. October 2, 1939. By Sun Oil Co. in Anahuac, October 2, 1939. By Gulf Refining Co. in Anahuac, October 2, 1939. On November 1, 1939, Gulf Refining Co. applied these prices to Anahuac, Hull (New), Pierce Junction, Orange, Thompson (deep).

Column 13—Effective October 2, 1939, by Humble Oil & Refining Co. and Continental Oil Co. By Texas Co. up to 28° and over at $1.09 October 2, 1939. Atlantic adopted Humble price schedule November 7, 1939, in Refugio and applied it also to Greta.

Column 14—Effective October 2 by Humble Oil & Refining Co. By Sun Oil Co. in Mirando alone, stopping at 24-24.9° at 96 cents. By Stanolind Oil & Gas Co. in West Beaumont, alone, October 2, 1939. Gulf Refining Co. in West Beaumont, October 2, 1939. By Magnolia Petroleum Co. in Beaumont, October 2, 1939. By Texas Co. in Duval and Mirando, stopping at 28-28.9° at $1.09. Continental Oil Co. in Mirando and Duval, October 2, 1939.

Column 15—Effective October 2, 1939, by Texas Co.

Column 16—Magnolia Petroleum Co., effective October 12, 1938.

Column 17—Standard Oil Co. of Louisiana, effective October 23, 1939.

Column 18—Continental Oil Co., effective October 11, 1938.

In the Bunkie and Eola pools in Louisiana, effective October 23, 1939, by Standard Oil Co. of Louisiana, below 25° 83 cents, 2 cents added for each degree up to 40° and over at $1.15.

Iowa, La., effective October 11, 1938, by Shell Petroleum Corp. and on April 1, 1939, by Shell Oil Co., Inc.: Below 18°, 75 cents; 18°-18.9°, 77 cents; 2-cent spread to 21°-21.9° at 83 cents; then a 3-cent spread to 26°-26.9° at 98 cents; then a 2-cent spread to 34° and above at $1.14.

Middle Western States

OHIO OIL CO.
(Effective June 8, 1939)

Illinois old fields	$0.95
Illinois basin	1.05
Princeton, Ind.	.95
Western Kentucky (June 9, 1939)†	.90
Birk City, Ky. (June 9, 1939)¶	.90
Corydon, Ky. (June 9, 1939)	.90
Greendale, Porter, Crystal and Wise, Mich. (Oct. 9, 1939)*‡	1.02
Buckeye, Bentley, Edenville, Beaverton, Mich. (Oct. 9, 1939)*	1.00
Freeman-Redding, Mich. (Oct. 9, 1939)‡	.97
Arenac, Mich. (Oct. 9, 1939)*	.82
West Branch, Mich. (Nov. 1, 1939)*	.85
Allegan-Kent (Oct. 10, 1939)	1.03
Bloomingdale and Columbia, Mich.¶	1.03
Muskegon	1.00
Sherman and Freeman, Mich. (Oct. 9, 1939)‡	.97
Eastern Kentucky:	
Big Sandy River (June 9, 1939)†	1.02
Kentucky River (June 9, 1939)†	1.10

*Simrall Corp. †Ashland Refining Co. ‡Pure Transportation Co. §Imperial Refining Co. ¶Sohio Oil Co. Bloomingdale posted by Tri-Lakes Corp. Kent County by Naph-Sol Refining Co. Effective Feb. 1, 1940, Sohio Corp. posted $1.05 per barrel in the Centralia, Salem, and Louden fields for crude up to 30 bbl. per well per day. In the McClosky lime fields of Clay, Wayne, and Noble counties it posted $1.05 per barrel up to 40 bbl. per well per day. For all oil produced in exces of the above figure in any of the fields named it posted $1 per barrel. On Oct. 10, 1939, Sohio posted 95 cents per barrel in the Griffin field in Gibson County, Indiana, and Wabash County, Illinois, for crude produced from sand and 90 cents for crude produced from limestone. In the Salem field in Illinois, effective March 13, Canyon Pipe Line posted $1.05 per barrel for the first 40 bbl. per well and 90 cents per barrel for oil in excess of 40 bbl. per well.

Rocky Mountain States

Dry Creek, Wyo. (Oct. 11, 1938)*	$0.92
Elk Basin, Wyo. (Oct. 11, 1938)*†	.90
Grass Creek, light, Wyo. (Oct. 11, 1938)*†	.90
Grass Creek, heavy (Oct. 11, 1938)†	.40
Lance Creek, Wyo. (Oct. 11, 1938)*.	.77
Rock Creek, Wyo (Oct. 11, 1938)*	1.00
Iles, light, Colo. (Oct. 11, 1938)†	.98
Iles, heavy, Colo. (Oct. 11, 1938)†	.92
Dutton Creek, Wyo. (Oct. 11, 1938)†	See note below
Frannie, light, Wyo. (Oct. 11, 1938)†	$0.55
Frannie, heavy, Wyo. (Oct. 11, 1938)†	.42
Hamilton dome, Wyo. (Oct. 11, 1938)†	.35
Midway, Wyo. (Oct. 11, 1938)†	See note below
Salt Creek Tensleep Crude, Wyo. (Oct. 11, 1938)†	$0.646
Salt Creek (Oct. 11, 1938)	See note below
Canon City, Colo. (Oct. 11, 1938)‡	$0.90
Florence, Colo. (Oct. 11, 1938)‡	.90
Cut Bank, Mont. (Jan. 1, 1940)	1.00
Kevin-Sunburst, Mont. (Jan. 1, 1940)	.80
Cat Creek, Mont. (Oct. 11, 1938)‡	1.10
Big Muddy, Wyo. (Oct. 11, 1938)‡	.98
Lance Creek, Wyo. (Oct. 11, 1938)‡	.77
Lea County, New Mexico	See West Texas gravity schedule‡
Artesia, Jackson and Maljamar	See gravity table‡
Fort Collins and Wellington, Colo.	See note below
Eddy County, New Mexico (Oct. 11, 1938)§	$0.77

*Ohio Oil Co. †Stanolind Oil & Gas Co. ‡Continental Oil Co. §Sinclair Prairie Oil Marketing Co.

Dutton Creek and Salt Creek Tensleep crudes start at below 29°, 86 cents, 2-cent spread up to 40° and over at $1.10. Salt Creek crude, excepting Tensleep, takes Standard Oil Co. of Indiana's Oklahoma-Kansas prices. Stanolind Oil & Gas Co., effective Oct. 11, discontinued posting prices in Greybull-Torchlight, Wyoming, and Hogback and Hospah, New Mexico. In Fort Collins and Wellington, Colorado, effective Oct. 11, 1938, by Continental Oil Co. 28-28.9°, 81 cents, with 2 cents added for each degree up to 40° and over at $1.05. Cut Bank and Kevin-Sunburst posted by Producers Refining Co.

Eastern States

SOUTH PENN OIL CO.
(Effective Jan. 1, 1940)

Pennsylvania Grade oil in National Transit lines (Bradford field)	$2.75
Pennsylvania Grade oil in Southwest Pennsylvania lines	2.40
Pennsylvania Grade oil in Eureka Pipe Line lines	2.34
Corning grade oil in Buckeye Pipe Line Co. line (Nov. 4, 1939)	1.12

TIDE WATER ASSOCIATED OIL CO. and NEW YORK TRANSIT CO.
(Effective Jan. 1, 1940)

Bradford, Pa.	$2.75
Allegany, N. Y.	2,75

PENNZOIL CO.
(Effective Jan. 1, 1940)

Group A	$2.68
Group B	2.67
Group C	2.66
Group D	2.65
Group E	2.63

PURE OIL CO.
(Effective Jan. 1, 1940)

West Virginia	$2.34

QUAKER STATE OIL REFINING CORP.
(Effective Dec. 1, 1939)

Southern Ohio (Pa. Grade)	$2.30

Canada

ONTARIO
(Nov. 6, 1939, by Imperial Oil, Ltd.)

Petrolia	$2.10
Oil Springs	2.07
Bothwell	2.10

TURNER VALLEY
(Jan. 5, 1938, by Imperial Oil, Ltd.)

Clear naphtha and discolored naphtha, 65° and higher	$2.14
Discolored naphtha and crude oil, 40°-40.9°	1.14
Increasing 2 cents for each degree gravity with top price for 64°-64.9°	1.62

These prices f.o.b. producers' field tankage.

Crude-Oil Prices

Retroactive to March 13 Canyon Pipe Line Co., which runs about 3,300 bbl. of oil per day from the Salem pool in Illinois and which had been paying 90 cents per barrel for all the oil it bought, posts $1.05 per barrel for the first 40 bbl. per well and 90 cents per barrel for oil in excess of 40 bbl. per well.

The Atlantic Refining Co. effective March 31 added Gaines County to its West Texas gravity schedule of crude prices.

Canadian Fields

(Continued from Page 119)

In Section 20-18-2w5, York Oils' No. 3, LSD 3, is deepening in the Blairmore formation below 7,034 ft. after a fishing job.

In Section 29-18-2w5, Commoil's No. 3, LSD 3, is below 5,098 ft. and getting close to the cardium sandstone.

In Section 32-18-2w5, Pacific Petroleums' No. 4, LSD 3, is below 4,541 ft. after getting the cardium marker at 4,325 ft. Royal Canadian Oil Co.'s No. 4, LSD 12, is in the Blairmore below 6,893 ft.

West Central Field

In Section 6-19-2w5, Kamalta Oils' No. 1, LSD 1, is in the Blairmore formation below 6,670 ft. after getting the grit beds at 6,150 ft. In Section 7-19-2w5, Royalite's No. 48, LSD 10, is in the Blairmore formation below 6,533 ft.

In Section 18-19-2w5, Okalta Oil Co.'s No. 9, LSD 13, is deepening after setting 13⅜-in. casing at 1,025 ft. Davies Petroleums' No. 5, LSD 10, is deepening after getting the Dalhousie sand at 6,718 ft. and is expected to get the lime around 6,950 ft.

North Turner Valley

In Section 16-20-3w5, North Turner Valley, Anglo-Phillips' No. 1, LSD 14, is below 7,981 ft. and getting close to the Dalhousie sand, with the limestone expected around 8,200 ft.

Waite Valley Test

In the Waite Valley area, west of North Turner Valley, National Petroleum Corp.'s No. 3, LSD 4, Section 25-20-4w5, will likely be abandoned at 7,580 ft. The test got the Blairmore formation high around 3,376 ft. with the Home sand at 6,430 ft. and the Dalhousie at 6,630 ft. The Kootenay was reported at 6,939 ft. and the Fernie shales at 7,272 ft, though some repetition of formations was indicated. Around 7,550 ft. the test encountered a fault, though the formation could not be definitely identified. The hole was deepened to about 7,580 ft. to secure more definite samples. Previous drilling in the Waite Valley area had repeatedly encountered faulting, but it was hoped the National Petroleum test would avoid this and reach the lime in a normal sequence. The company has two crude producers in South Turner Valley.

Steveville Field

In the Steveville field, east of Calgary, Standard of British Columbia's No. 1 Princess, LSD 13, Section 22-20-12w4, has killed off a wild gas flow of 65,000,000 cu. ft. encountered several weeks ago in the Devonian limestone. Steel derrick has been erected and drilling is resuming from 5,254 ft. to test the lower Devonian where oil is expected. Standard's No. 2 has been located in NW Section 29-18-9w4, about 16 miles south of No. 1.

STANDARD OIL CO. OF CALIFORNIA

Crude-oil prices at the well effective February 1, 1940

(All gravities above those quoted take highest price offered in that field)

Gravity—	Signal Hill (Long Beach) (El Segundo)	Wilmington	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canyon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley-Canal	Cole's Levee Richfield Western	Mountain View	Elk Hills	Buena Vista, Midway-Sunset, Lakeview	Lost Hills	Coalinga	Kettleman Hills
14-14.9	$.65	$.60	$.64	$.63	$.64	$.65	$.61	...	$.65	$.61	$.61	$.62	$.63	...	...	...	...	$.60	$.60	$.60	$.60	...
15-15.9	.65	.60	.64	.63	.64	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
16-16.9	.65	.60	.64	.63	.64	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
17-17.9	.65	.62	.64	.63	.68	.65	.61	...	.65	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
18-18.9	.65	.64	.64	.63	.71	.65	.65	...	.68	.61	.61	.62	.63	...	...	...	...	.60	.60	.60	.60	...
19-19.9	.69	.69	.64	.67	.75	.70	.69	...	.72	.61	.65	.62	.63	...	...	...	$.60	.64	.64	.64	.61	...
20-20.9	.73	.73	.64	.72	.79	.76	.74	...	.75	.65	.69	.62	.67	...	...	...	.60	.69	.69	.69	.62	...
21-21.9	.78	.78	.64	.76	.82	.81	.78	...	.79	.69	.73	.62	.72	$.63	...	...	.64	.74	.74	.74	.66	...
22-22.9	.82	.82	.69	.81	.86	.86	.82	...	.82	.73	.77	.66	.76	.63	...	...	.68	.79	.79	.78	.70	...
23-23.9	.86	.86	.75	.85	.89	.92	.86	$.71	.86	.78	.82	.71	.81	.67	...	...	.71	.84	.84	.82	.74	...
24-24.9	.90	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	...	...	.75	.89	.89	.86	.78	...
25-25.9	.95	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	...	...	.79	.94	.94	.90	.82	...
26-26.9	.99	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	...	...	.83	.99	.99	.95	...	...
27-27.9	1.03	1.03	.97	1.03	1.04	...	1.03	.94	1.00	.94	.98	.89	.98	.87	$.83	$.92	.87	1.04	1.04	.99	...	...
28-28.9	1.07	1.07	1.02	1.07	1.07	f.o.b.	1.07	.99	1.03	.98	...	.93	1.02	.91	.86	.96	.91	1.09	1.09	1.03	...	...
29-29.9	1.10	1.10	1.07	1.11	1.10	our	1.10	1.04	1.06	1.02	...	.98	1.06	.96	.90	.99	.95	1.14	1.14	1.07	...	...
30-30.9	1.14	1.14	1.12	1.15	1.14	pipe	1.14	1.09	1.09	...	...	1.02	1.10	1.01	.94	1.02	.99	1.19	1.19	1.11	...	...
31-31.9	...	...	...	...	1.17	line	1.17	1.14	...	...	...	1.07	1.14	1.05	.98	1.06	1.02	1.24	1.24	...	...	...
32-32.9	...	...	...	...	1.20	...	1.20	1.19	...	...	...	1.11	1.18	1.09	1.02	1.09	1.06	1.29	1.29	...	...	...
33-33.9	...	...	...	...	...	...	...	1.24	...	...	...	1.15	1.22	1.14	1.06	1.13	1.10	1.34	1.34	...	...	$1.12
34-34.9	...	...	...	...	...	...	...	1.29	...	...	...	1.20	1.26	1.19	1.10	1.16	1.14	...	...	...	...	1.17
35-35.9	...	...	...	...	...	...	...	1.34	...	...	...	1.24	...	1.23	1.14	1.20	...	...	...	...	...	1.21
36-36.9	...	...	...	...	...	...	...	1.39	...	...	...	1.28	...	1.27	1.18	1.23	...	...	...	...	...	1.25
37-37.9	...	...	...	...	...	...	...	1.44	...	...	...	1.33	...	1.31	1.22	1.26	...	...	...	...	...	1.29
38-38.9	...	...	...	...	...	...	...	1.49	...	...	...	1.37	...	1.36	1.25	1.30	...	...	...	...	...	1.33
39-39.9	...	...	...	...	...	...	...	1.54	...	...	...	1.42	...	...	1.29	1.34	...	...	...	...	...	1.38
40-40.9	...	...	...	...	...	...	...	1.59	...	...	...	1.46	...	...	1.33	1.37	...	...	...	...	...	...
41-41.9	...	...	...	...	...	...	...	...	...	...	...	1.50	...	...	1.37	1.40	...	...	...	...	...	...
42-42.9	...	...	...	...	...	...	...	...	...	...	...	1.54	...	...	1.41	1.44	...	...	...	...	...	...
43-43.9	...	...	...	...	...	...	...	...	...	...	...	1.59	...	...	1.45	1.47	...	...	...	...	...	...
44-44.9	...	...	...	...	...	...	...	...	...	...	...	1.63	...	...	1.49	1.51	...	...	...	...	...	...
45-45.9	...	...	...	...	...	...	...	...	...	...	...	1.67	...	...	1.53	1.54	...	...	...	...	...	...
46-46.9	...	...	...	...	...	...	...	...	...	...	...	1.71	...	...	1.57	1.57	...	...	...	...	...	...
47-47.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1.61	...	...	...	...	...	...	...
48-48.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1.64	...	...	...	...	...	...	...

For Newhall, McKittrick, Kern River, Round Mountain and Kern Front crude, Standard posts 60 cents per barrel for all grades. For Elwood Terrace crude (free on board ship), 33-33.9, $1.21, with 4 cents added for each degree up to and including 37° and over at $1.37; Wheeler Ridge crude, 19 to 21.9°, 60 cents; 22-22.9, 63 cents; 23-23.9, 67 cents; 24-24.9, 71 cents; 25° and over, 75 cents.

Market Record of Active Oil Stocks

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1940 High	1940 Low	Week ended Apr. 6 High	Week ended Apr. 6 Low	Week ended Apr. 6 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1939	Com. sh. earn. 1938	Com. sh. earn. 1937	1939 High	1939 Low	1938 High	1938 Low
58½	53	58½	54¼	57½	Amerada Corp.	788,675	N.P.	50cQ	1-31-40	$2.00	$2.07	$3.04	74½	50	78	55
23⅝	20½	23	22⅝	23	Atlantic Refining	2,663,999	$25	25cQ	3-15-40	1.00	1.40	3.51	24⅝	18½	27⅝	17⅜
16⅝	13⅝	16⅝	14⅞	16	Barber Asphalt Co.	390,223	$10	25c	2-20-40	.25	—.85	1.91	21	10½	23⅝	12½
13⅜	10¾	12	10¾	11⅞	Barnsdall Oil Co.	2,250,344	$5	15c	3-9-40	.90	1.26	.85	19½	11⅛	21⅜	10⅛
8	7	7⅞	7½	7⅞	Consolidated Oil Corp.	13,751,846	N.P.	20cQ	5-15-40	.80	.55	1.48	9⅞	6½	10⅝	7
25	22⅛	23⅞	22¼	23⅝	Continental Oil of Delaware	4,682,581	$5	25cQ	3-25-40	1.00	1.10	2.98	31½	19⅞	35¾	21⅛
6⅞	5½	6¼	5⅝	6	Houston Oil	1,098,618	$25		10-17-30	....	.83	.94	9⅜	4½	9⅜	5
13½	11¾	13⅛	12⅝	13	Lion Oil Refining	435,815	N.P.	25cQ	4-1-40	1.00	2.09	2.17	18⅛	10	25⅛	15⅝
16⅝	13¾	16¼	15	16¼	Mid-Continent Petroleum	1,857,912	$10	40c	6-1-40	.60	.56	2.86	18	11⅛	22⅝	12¼
10⅝	9½	11	9⅝	11	Mission Corporation	1,379,245	$10	40c	12-15-39	.65	1.04	1.31	14⅞	8⅜	17⅜	10⅝
9¾	8⅛	9¼	8⅝	8⅞	National Supply	1,155,517	$10	....	12-22-37	....	—.79	4.90	15⅛	5⅝	23	12⅛
8	6½	8	7¼	7⅞	Ohio Oil Co.	6,563,377	N.P.	20c	12-15-38	....	.25	1.30	10⅛	6	14⅞	8⅜
8¼	7	8⅛	7	8	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	.40	1.22	1.39	11⅞	7	15⅞	10¼
8	6⅜	..	..	..	Pan American Pet. & Trans.	4,702,945	$5	....	12-31-37		.08	1.18	8⅜	5	9¼	6¼
41¾	36½	39⅞	37⅞	39¾	Phillips Petroleum	4,449,052	N.P.	50cQ	3-1-40	2.00	2.03	5.42	46½	31¼	44⅜	27¼
22¾	20½	21⅞	21⅜	21⅜	Plymouth Oil Co.	1,006,200	$5	35cQ	3-30-40	‡1.40	2.59	2.85	24	17½	25⅜	15
10¼	8⅛	10¼	9⅛	10¼	Pure Oil Co.	3,982,031	N.P.	25c	12-20-39	.25	.38	2.15	11¾	6⅛	13½	8¼
8⅜	6⅜	7¼	6⅞	7⅛	Richfield Oil Corp.	4,010,000	N.P.	50c	12-18-39	.50	.51	.35	10¼	6⅜	9⅞	5
20	17¾	19¼	18	18⅜	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	3-15-40	1.00	1.52	1.97	24⅜	15½	27½	15½
13⅛	10⅝	12⅝	12	12⅝	Shell Union Oil	13,070,625	N.P.	25c	12-20-39	.50	.72	1.44	17¼	9⅞	18⅜	10
22½	18½	22½	19¾	21½	Skelly Oil	995,349	$15	25c	1-30-40	.75	2.27	6.07	29½	15½	34⅝	18½
12½	11⅛	12⅜	11⅜	12⅛	Socony-Vacuum	31,206,071	$15	25cSA	3-15-40	.50	1.29	1.82	15⅛	10¼	16⅜	10⅝
26⅛	22⅝	24⅜	23	24⅜	Standard Oil of California	13,004,153	N.P.	25cQ	3-15-40	1.10	2.22	3.17	33⅝	24¼	34⅞	25⅛
29	25	29	27⅝	28⅛	Standard Oil (Indiana)	15,272,020	$25	25c	3-15-40	1.25	1.82	3.66	30	22¾	35½	24⅜
46½	42¾	44	43⅛	43⅝	Standard Oil of New Jersey	26,618,065	$25	75c‖	12-15-39	‖1.25	2.86	5.64	53½	38	58⅝	39⅜
63⅝	56¼	62½	61⅛	62½	Sun Oil	2,316,484	N.P.	25c*	3-15-40	1.00	1.07	3.86	66	45⅝	65⅛	45
2½	2	2¼	2	2⅛	Superior Oil Corp.	1,388,979	$1	10c	12-28-38	....	.24	.32	3⅝	1⅝	4¼	1⅝
47⅝	42⅝	47⅝	45⅜	47⅜	Texas Corp.	10,876,882	$25	50cQ	4-1-40	2.00	2.13	5.02	50¾	32½	49⅝	32⅝
4¼	3½	4¼	3⅝	4⅛	Texas Gulf Producing Co.	888,146	N.P.	10c	6-15-40	.20	.86	.68	5⅜	3¼	5⅞	2⅝
8⅝	7½	8⅛	7⅞	8⅛	Texas Pacific Coal & Oil	888,236	$10	10c	3-1-40	.40	1.16	1.11	11⅜	7	12½	7
11¼	10	11⅛	10¼	11⅛	Tide Water Associated	6,375,253	$10	15c	3-1-40	.80	1.28	2.08	14¼	9½	15⅝	10½
17½	16	17	16⅝	16¾	Union Oil Co. of California	4,666,270	$25	25c	5-10-40	1.05	1.47	2.58	19⅜	15⅛	22½	17⅛
27¼	22⅜	27	26⅝	26⅞	Union Tank Car Co.	1,177,381	N.P.	40c†	3-1-40	1.30	1.16	1.70	24¼	20½	23½	20
3⅝	2⅞	3¼	3	3⅛	Wilcox Oil & Gas	487,568	$5	10c	2-15-40	....	.52	.24	4¼	2⅜	3½	1⅝

*Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. §Also 4 per cent in stock. ‖Also 2½ per cent in stock. ¶Also 1½ per cent in stock. —Deficit.

New York Curb Exchange

1940 High	1940 Low	Week ended Apr. 6 High	Week ended Apr. 6 Low	Week ended Apr. 6 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1939	Com. sh. earn. 1938	Com. sh. earn. 1937	1939 High	1939 Low	1938 High	1938 Low
8⅞	6⅛	8¾	8	8¼	American Republics Corp.	1,308,049	$10	10c	7-11-38	....	—$0.22	$0.27	11¾	5½	11¾	5
3¼	2¼	2¾	2¼	2½	Bridgeport Machine Co.	270,000	N.P.	$1.25	12-30-37	....	—.14	1.90	7¼	2½	10¼	4⅞
43	28	38½	38¼	38½	Buckeye Pipe Line Co.	200,000	$50	$1	3-15-40	$2.50	2.36	4.02	34¾	26½	39	22¼
117	110	117	114	117	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	3-29-40	6.00	5.32	6.73	130	108⅝	128	97
5⅜	4	5⅜	4⅞	5¼	Cities Service (new)	3,704,067	$10	....	6-1-32	....	.23	1.02	9¼	4¼	11	5⅛
1⅝	1⅛	1⅞	1½	1⅞	Cosden Petroleum	462,551	$1	....	....	....	....	.19	2¼	⅛	2⅜	⅞
22⅜	19¾	21	20½	21	Creole Petroleum	6,975,383	$5	50cSA†	12-15-39	1.00	1.64	1.61	28	16¾	27½	17½
4⅜	4	4¼	4¼	4¼	Darby Petroleum	351,390	$5	25cSA	1-15-39	.25	....	1.36	7⅛	3⅝	10¼	5½
2	1⅝	..	..	..	Derby Oil & Refining	263,162	N.P.	....		....	—.91	1.34	2⅝	1½	3½	1½
31	23½	31	29½	29½	Eureka Pipe Line	50,000	$50	75c	5-1-40	2.00	—.37	—.12	23	15⅛	31	16
39⅞	34	37½	35⅜	37	Gulf Oil Corp.	9,076,202	$25	25cQ	4-1-40	1.00	1.43	3.51	45⅛	29¼	46⅞	33
68	58	63	60¾	62	Humble Oil & Refining	8,987,840	N.P.	62½c	4-1-40	2.00	3.98	5.22	71	52½	72⅝	56
12⅜	10⅝	11¼	10⅝	11	Imperial Oil of Canada	26,965,078	N.P.	37½c†	12-1-39	1.00	.96	.98	17	11⅝	19½	14⅛
7¾	5¾	7⅛	6⅞	7	Indiana Pipe Line	300,000	$10	10c	5-15-40	.50	.47	1.03	7⅛	5½	9⅜	6
19¾	16½	17	16½	16¾	International Petroleum	14,324,088	N.P.	75c	12-1-39	1.75	1.98	....	27½	17	31¼	21
2¾	2¼	2½	2¼	2¼	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	....	.14	.17	3¾	2⅛	5	2⅛
10⅜	9⅝	10	9¾	9¾	Lone Star Gas	5,553,747	N.P.	20c	4-22-40	.70	.88	1.14	10½	7⅛	10⅜	6⅝
6⅛	5	6⅛	5⅞	6⅛	Louisiana Land & Exp.	2,977,449	$1	10c	3-15-40	.35	.45	.58	7¾	4	9⅜	6⅛
17	11½	17	17	17	Margay Oil Corp.	149,943	N.P.	25cQ	4-10-40	1.00	2.28	3.26	17	14½	24	16
8	7¼	7⅞	7¾	7⅞	Midwest Oil Co.	998,474	$10	45c	12-15-39	.90	.93	1.14	8¾	6⅝	9¾	6⅝
6	5¼	6	5¾	5⅞	Mountain Producers	1,593,584	$10	30cSA	12-15-39	.60	.62	.76	6	4⅞	5⅝	4½
13¼	12	12¾	12½	12½	National Fuel Gas	3,810,183	N.P.	25cQ	4-15-40	1.00	.84	.96	14	11¼	14⅝	11½
11¼	8¾	11¼	11⅛	11¼	National Transit	509,000	$12.50	50c	12-15-39	.85	.88	1.19	9½	7¼	9¼	6½
1¼	1	1¼	1⅛	1⅛	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	1⅝	1	2⅝	1⅛
6½	5¼	6½	6½	6½	New York Transit	100,000	$5	25c	4-15-40	.40	.16	.49	6	4	4½	3½
8	6¾	..	..	..	Northern Pipe Line	120,000	$10	15c	12-1-39	.30	.24	.78	7	4½	6	4
5½	4⅝	5	4⅝	4⅞	Pantepec Oil	2,857,000	$1	....		....	....	....	7⅝	4	7⅜	3½
3¼	2¼	2⅞	2⅝	2¾	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.17	—.17	5	1¼	4½	1⅝
2¼	1⅞	2⅛	2⅛	2⅛	Ryan Consolidated	298,931	N.P.		..		.29	.46	3	1⅞	4	2⅛
9	4⅞	9	8⅜	8¾	Southern Pipe Line	100,000	$10	15c	3-1-40	.30	—.27	.85	4⅞	3½	5⅜	3¼
44	37½	39½	38½	39½	South Penn Oil	1,000,000	$25	37½c	3-29-40	3.00	1.44	4.64	40½	26¾	39	28⅝
35	22	28	28	28	Southwest Penna. Pipe Lines	35,000	$50	$5	4-1-40	2.00	—.41	.95	23	18	22¼	16½
20⅞	20	20¾	20⅜	20⅝	Standard Oil of Kentucky	2,604,790	$10	25c	3-15-40	1.30	1.45	1.60	20½	17¼	18⅜	15
37½	28¾	37	35½	36¾	Standard Oil of Ohio	753,740	$25	25c	3-15-40	1.50	1.81	3.67	32¾	17	22⅜	16⅛
2	1¾	1⅞	1¾	1⅞	Sunray Oil	2,007,076	$1	5c	5-1-40	.10	.23	.42	2¾	1¾	3¼	2
2¾	2½	2¾	2⅝	2¾	Texon Oil & Land	936,024	$2	10c	3-29-40	.10	.56	.51	4	2⅝	5⅛	3⅛
3⅜	2¼	2½	2⅜	2⅜	Transwestern Oil Co.	750,000	$10	....	.....	....	—.12	.48	6	2½	7⅝	4¼
2⅛	1¼	1⅝	1½	1⅝	United Gas Corp.	7,818,959	$1	....	.....	....	—.51	.25	3⅜	1½	5¼	2⅝

†Includes extras. —Deficit.

Oklahoma City Field Enjoying Another Periodic Flurry

(Continued from Page 15)

detrital, Cleveland, lower, middle and upper Hoover, Tonkawa, oolitic and Prue formations. Deepening or plugging-back operations in many of the old wells that have become exhausted in their original pay zone have accounted for much of the work in the field for the past year or so.

There are about 13,253 productive acres in the field, with an average recovery of 35,889 bbl. an acre, according to the conservation director.

The Wilcox zone, discovered March 25, 1930, covers approximately 4,837 acres, with an average recovery of 71,097 bbl. an acre, the commission's records show.

Another tabulation, which limits the productive Wilcox sand zone to 4,680 acres and which takes into consideration oil produced but not reported to the commission, gives an average recovery of 76,481 bbl. an acre for the zone.

Highest Acreage Recovery

The record for the field is held by the 160-acre tract in SE Section 34-12-3w, designated as Area 10 in Table 2, which had average recovery of 205,731 bbl. an acre from Wilcox sand up to January 1.

Thirty-nine wells drilled on that 160 acres had produced 32,917,000 bbl. of oil at the first of the year, the wells averaging 844,026 bbl. each.

A bigger well average is shown by the 28 wells on the 160 acres in NE Section 3-11-3w, listed as Area 13 in the table and immediately south of Area 10.

These 28 wells averaged 1,125,607 bbl. each, for a total of 31,517,000 bbl. for the quarter section. That average is being increased daily, as 26 of the 28 wells still are producing.

The record for the Wilcox zone in its entirety is shown in Table 2.

Nearly 100 individual operators and companies have shared the Oklahoma City production. Of these, 64 have produced in excess of 500,000 bbl. of oil, with seven companies producing more than 10,000,000 bbl. each. Production by companies is shown in Table 3.

Daily average production of the field for the week ended April 6 was 102,500 bbl. The March allowable was 103,150 bbl. daily.

TABLE 3—OPERATORS' PRODUCTION

Operators producing more than half a million barrels in the Wilcox zone and their total production of crude to January 1 follow:

Company—	Wilcox yield
Acme	1,991,839
American	1,889,115
Anderson-Prichard (H. J. Brown, receiver)	565,745
Anderson-Prichard	7,558,561
Barnsdall	6,025,008
Big Chief	1,469,162
Black Gold	3,543,555
Blackwell	760,291
British-American	26,210,118
Bryan	2,031,633
Burns	1,250,463
Caprock	575,392
Carter	27,339,871
Century	2,171,150
Champlin	3,036,895
Chatham	1,266,999
Cities Service	1,693,108
Clark	1,154,994
Community	965,919
Continental	4,765,952
Davon	3,333,365
Denver	3,932,921
Eason	2,131,701
Franco-Dominion	612,454
Franklin	654,980
Grimes-Abilene	2,430,450
Grison	2,318,513
Hall, F. C.	684,617
Hall & Briscoe	1,240,170
Helmerich & Payne	975,119
Indian Territory	38,574,911
Inland	2,849,438
Jameson-Grimes	665,977
Johnson-Kemnitz	948,398
Kerlyn	6,336,462
Larkins & Warr	1,775,526
Lassen & Corn	735,799
Mabee	2,132,290
Mexhoma	581,185
Mid-Continent	1,883,670
Minnehoma	892,756
Morgan	618,239
Murray & Stephens	827,045
Nebo	835,937
Oils, Inc.	2,324,004
Oil Well Operating	710,266
Patton	509,938
Phillips	90,107,332
Plains	877,699
Rotary	858,999
Russell	1,370,467
Shaffer	1,790,070
Sinclair Prairie	10,914,164
Skelly	5,135,957
Southwest	649,144
Sunray	17,819,897
Superior	2,337,703
Tower	3,348,682
Transwestern	6,543,867
Trust Operating Division	2,012,126
Watchorn	1,032,334
Western Crude	623,584
Westgate	11,561,837
Wilcox	3,545,419

Wells in the Wilcox zone are allowed to produce 165 bbl. daily plus 56 per cent of the remaining potential. Any well is permitted to run a marginal of 165 bbl. or its full production if incapable of making that much daily.

Wilcox sand wells averaged 88,000 bbl. daily last November, producing at the rate of 46 per cent of the allowable after deducting the marginal 165 bbl. a well.

The percentage of allowable was increased to 50 per cent in December, and again they averaged 88,000 bbl. daily.

Allowable Is Increased

The percentage was increased to the present 56 per cent in January, and in that month total production from Wilcox sand wells averaged 84,900 bbl. daily.

Of 350 leases in the Wilcox zone, 68 made their full allowable in December and 80 made their allowable in January.

Thus it is seen that the Wilcox wells are producing almost to capacity. It is estimated, however, that if proration restrictions were removed and they were allowed to produce to capacity for 30 days they would average 95,000 bbl. daily.

In addition to the oil wells, there are 101 gas wells in the field, with potential volume of 421,805,000 cu. ft. of gas daily.

The current drilling activity and similar spurts that may follow from time to time notwithstanding, the Oklahoma City field is approaching the era of secondary recovery.

A phase of this will be the plugging back of exhausted wells to shallower sands. These shallow horizons, in addition to producing the bulk of the gas in the field, may be expected to account for an increasing percentage of the oil production in the coming months.

The field's greatest prospects for the future, however, apparently rest with plans for repressuring the Wilcox and Simpson zones.

It was estimated by the U. S. Bureau of Mines in 1936 that between 410,000,000 and 460,000,000 bbl. of oil would be recovered from the Wilcox zone by primary means. Present production totals for the zone indicate the estimate was approximately correct.

Field's Future Prospects

Some engineers have estimated about half of the oil originally in the pool still is in the ground, and that around 20 per cent may be produced by present methods. The bulk of the remainder, they believe, may be recovered by secondary methods, such as repressuring.

It is the belief of some of these students of the field that another 300,000,000 bbl. of oil may be recovered from the Wilcox zone by repressuring.

The Oklahoma City Wilcox Secondary Recovery Association, organized in March 1939, has been making a scientific study of the possibilities of a repressuring project. This work is under the direction of C. V. Sidwell, petroleum engineer. Don R. Knowlton, superintendent of production for Phillips Petroleum Co., is chairman of the operators' advisory committee. About 80 per cent of the operators in the field are contributing to the survey. It originally was thought the study could be completed within 1 year, but the association recently extended the study period 6 months from last March 1. A legal committee is working on proposed legislation that will be necessary if the repressuring project is undertaken.

The engineering committee will not divulge results of its study until the survey is completed. Until that time it will not be known what method of secondary recovery may be employed if the project eventually is approved and all obstacles are hurdled—whether gas repressuring or a combination of gas and water. There already has been some evidence of successful gas recycling on a few tracts in the south end of the field.

If repressuring of the zone eventually is undertaken it will be a pioneer project, for no secondary method of recovery has ever been tried at depths of around 6,500 ft., prevailing at Oklahoma City. Successful repressuring projects in other fields have all been at shallow depths. If the repressuring project is undertaken, it will not cause a boom but it may greatly increase ultimate production and extend life of the field a quarter of a century.

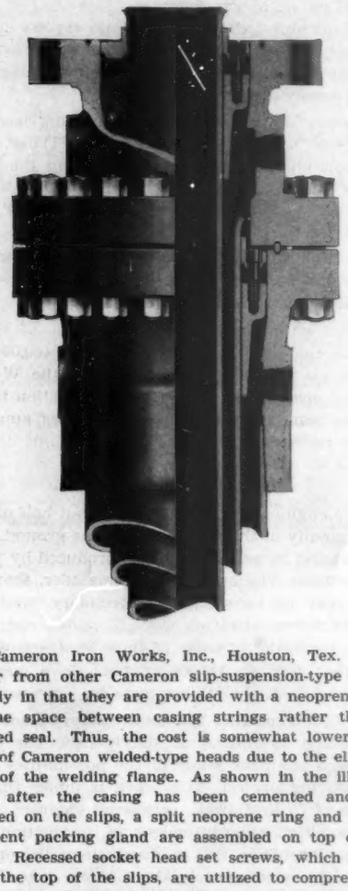
TABLE 2—OKLAHOMA CITY FIELD

Area	Location—	Production to Jan. 31, 1940	No. wells— Total	No. wells— 1-31-40	Prod. per well	Number acres	Production per acre	Acres to well
1	S½ Sec. 15-12-3w	1,831,000	14	4	130,786	45	40,681	3.2
2	N½ Sec. 22 and NW Sec. 23	9,995,000	40	31	249,875	180	55,528	4.5
3	S½ Sec. 22-12-3w	20,383,000	42	42	485,310	200	101,915	4.8
4	SW Section 23-12-3w	10,388,000	20	20	519,400	80	129,850	4.0
5	N½ Sec. 27-12-3w	11,095,000	26	26	426,731	150	73,967	5.8
6	NW Sec. 26-12-3w	2,535,000	10	1	253,500	50	50,700	5.0
7	S½ Sec. 27-12-3w	7,806,000	25	25	312,240	160	48,787	6.4
8	N½ Sec. 34-12-3w	19,946,000	34	29	586,647	200	99,780	5.9
9	SW Sec. 34-12-3w	7,067,000	12	11	588,916	40	176,675	3.2
10	SE Sec. 34-12-3w	32,917,000	39	38	844,026	160	205,731	4.1
11	SW Sec. 35-12-3w	3,215,000	11	4	295,545	80	41,875	7.3
12	NW Sec. 3-11-3w	18,995,000	32	14	593,593	150	126,633	4.7
13	NE Sec. 3-11-3w	31,517,000	28	26	1,125,607	160	196,983	5.7
14	NW Sec. 2-11-3w	24,481,000	47	9	520,872	125	195,898	2.7
15	SW Sec. 3-11-3w	7,231,000	19	10	380,589	150	48,206	7.4
16	SE Sec. 3-11-3w	7,198,000	25	8	287,920	160	44,987	6.1
17	SW Sec. 2-11-3w	1,157,000	7	0	165,273	60	19,284	8.6
18	NW Sec. 10-11-3w	17,037,000	39	21	436,846	160	106,481	4.1
19	NE Sec. 10-11-3w	15,972,000	27	16	591,555	140	114,088	5.2
20	SW Sec. 10-11-3w	7,745,000	21	13	368,810	100	77,450	4.8
21	SE Sec. 10-11-3w	8,870,000	15	10	591,801	100	88,700	6.7
22	N½ Sec. 15-11-3w	11,105,000	21	17	528,810	190	58,447	9.0
23	S½ Sec. 15-11-3w	12,398,000	29	21	427,517	130	95,369	4.5
24	N½ Sec. 22-11-3w	2,922,000	19	9	153,789	100	29,220	5.3
25	SW Sec. 22-11-3w	3,355,000	13	6	258,076	60	55,917	4.6
26	SE Sec. 22-11-3w	16,597,000	54	18	307,351	140	118,550	2.6
27	NE Sec. 27-11-3w	4,220,000	15	9	281,333	90	46,889	6.0
28	NW Sec. 26-11-3w	4,627,000	11	10	420,636	90	51,411	8.2
29	SW Sec. 26 and NW Sec. 35	2,159,000	9	5	228,778	90	22,878	10.0
30	SE Sec. 26 and NE Sec. 35	4,242,000	9	8	471,333	150	22,800	16.7
31	SW Sec. 25 and W½ Sec. 36	5,107,000	18	12	283,722	240	21,279	13.3
32	E½ Sec. 36-11-3w	4,740,000	15	10	316,167	170	27,888	11.3
33	W½ Sec. 31-11-2w	8,171,000	14	10	583,642	170	48,065	12.1
34	SE Sec. 31 and NE 6-10-2w	5,256,000	17	8	309,176	170	30,918	10.0
35	SE Sec. 32-11-2w	490,000	3	2	163,333	40	12,250	13.3
36	East of fault	5,161,000	15	7	344,067	200	25,805	13.3
	Total	357,932,000	795	510	450,228	4,680	76,481	5.9

EQUIPMENT PROGRESS...

Cameron Casing Head and Spool Employ New Sealing Method

The sectional drawing illustrates the design and construction of the new Type W casing head and spool recently added to the line of well heads manufactured



by Cameron Iron Works, Inc., Houston, Tex. They differ from other Cameron slip-suspension-type heads mainly in that they are provided with a neoprene seal of the space between casing strings rather than a welded seal. Thus, the cost is somewhat lower than that of Cameron welded-type heads due to the elimination of the welding flange. As shown in the illustration, after the casing has been cemented and suspended on the slips, a split neoprene ring and three-segment packing gland are assembled on top of the slips. Recessed socket head set screws, which screw into the top of the slips, are utilized to compress the neoprene packing and thus effect a pressure-tight seal between the casing strings.

There are no threads in the top of the casing head or spool to be damaged by the drilling tools. According to the manufacturer, both the casing-head housing and spool are of standard Cameron design and will accommodate either of the two types of Cameron welding flanges as well as all types of Cameron slip-suspension and boll-weevil hangers.

TRADE LITERATURE

LEWIS-SHEPARD SALES CORP., Watertown, Mass.—Catalog 21, materials-handling equipment. The book, which commemorates 25 years of service, contains 56 pages, covering over 175 of the more important items distributed.

PYOTT FOUNDRY & MACHINE CO., 328 North Sangamon Street, Chicago.—16-page booklet containing pictorial description of methods used at the Pyott plant.

COCHRANE CORPORATION, Seventeenth Street and Allegheny Avenue, Philadelphia, Pa.—Bulletin 2950, Cochrane all-service baffle-type separators.

THE INTERNATIONAL NICKEL CO., 67 Wall Street, New York.—Current issue Nickel Cast Iron News, containing "Refinery Uses of High-Alloy Iron Prove Economical" and "5-to-1 Superiority in Acidizing Pumps for Oil Wells."

F. J. STOKES MACHINE CO., Tabor Road, Philadelphia, Pa.—Bulletin 907, laboratory-type water stills for professional, scientific and many industrial uses.

NORTON CO., Worcester, Mass.—Latest issue of Norton Service, which features consulting engineering service for solution of grinding problems.

LANDIS MACHINE CO., INC., Waynesboro, Pa.—Bulletin, "Landisize Your Threads," describing and illustrating Landis threading equipment.

CRANE CO., 836 South Michigan Avenue, Chicago.—March-April The Valve World, featuring "What Is Preventive Maintenance?" by H. M. Mitchell.

THE FOXBORO CO., Foxboro, Mass.—Bulletin D.M.F. 189, Stabiflo valves, with cutaway view of one of these valves.

MERCO NORDSTROM VALVE CO., 400 Lexington Avenue, Pittsburgh, Pa.—Figure-number slide-rule chart, by which engineers may ascertain instantly the figure number of the Nordstrom valve in any available size for any pressure.

AMERICAN HOIST & DERRICK CO., St. Paul, Minn.—Bulletin 100-H-O, Model 20 American general-purpose hoist, and new 32-page Crosby clip book, "With an Eye to Safety."

THE LINCOLN ELECTRIC CO., Cleveland, Ohio.—"Life on the Welding Front," presenting pictures and explanations of interesting applications of welding.

A. P. GREEN FIRE BRICK CO., Mexico, Mo.—Illustrated folder describing high-heat-duty fire brick.

WILSON WELDER & METALS CO., INC., 60 East Forty-second Street, New York.—Illustrated 24-page booklet, "Wilson Arc Welding Electrodes."

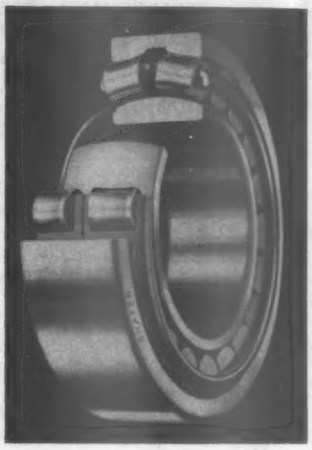
SPRAYING SYSTEMS CO., 4021 West Lake Street, Chicago.—Catalog 20, spraying systems, nozzles, nozzle accessories.

THE BRISTOL CO., Waterbury, Conn.—Bulletin 540, Bristol's P.V.T.T. recorders, giving record of gas pressure, volume, temperature, and time.

WYATT METAL & BOILER WORKS, Houston and Dallas, Tex.—March-April number of the Wyatt Way; contains pictures showing how skilled craftsmen and precision tools are making it safer and easier for the oil industry to carry on.

New Model of Double-Row Roller Bearing Introduced by Shafer

A new type of double-row roller bearing announced by Shafer Bearing Corp., 35 East Wacker Drive, Chicago, is available in DR 200 series, sizes from 3.1490-in. to 5.9045-in. bore; and DE 300 series, sizes from 1.9680-in. to 5.1171-in. bore.



The DE series is a self-contained double-row angular-contact type. Shafer concave rollers operate between convex races, the one-piece outer race having two ground raceways. The concave-roller design provides self-alignment within the bearing itself, and capacity for radial loads, thrust loads in either direction, or any combination of radial and thrust loads.

Rollers are of generous size, and the design permits use of a maximum number, providing ample double-row roller-bearing capacity in a compact bearing assembly. The exclusive Shafer concave-roller design provides inherent self-alignment, to insure free-rolling action under conditions of shaft deflection or misalignment. Thrust capacity is provided through the shape and position of rollers and races, without requiring auxiliary means of taking thrust. Complete information is given in Catalog 15.

USE OF STANDARD UNIBOLT STEEL FITTINGS ILLUSTRATED

The accompanying picture of a two-wing 6,000-lb.-test christmas tree illustrates the use of standard Unibolt steel couplings and fittings, introduced by Thornhill-Craver Co., Inc., Houston, Tex.

The top connection on the cross is provided with a blanking plug, which is tapped for a pressure gage. This blanking plug, interchangeable with standard Unibolt steel couplings, eliminates the use of a bull plug on top of the tree and provides easy and quick access to the well for running bottom-hole pressure bombs or paraffin scrapers. By attaching a plain hub and holding member of a Unibolt steel coupling to the bottom of the lubricator, it can be quickly attached to any Unibolt connection of the same type or size.

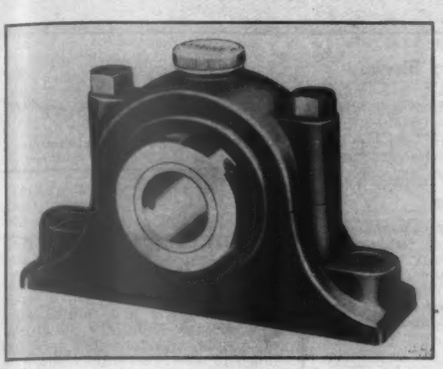
The adjustable choke shown on one wing of the tree may be converted into a positive-type choke by replacing the bonnet assembly and stem seat with a blanking plug and positive bean, respectively. The bonnet assembly itself may then be used to convert any Unibolt positive-type choke assembly into an adjustable type by reversing the procedure, as the bonnet assembly is freely interchangeable on all Unibolt choke bodies of 2-in., 2½-in. and 3-in. sizes.

The Unibolt cross shown on the opposite wing of the tree has a blanking plug similar to those on the top of the tree and on the tubing head outlet, and it is provided with a bleeder-type plug for releasing trapped pressure. A cage nipple and positive bean may be inserted in the threads opposite the blanking plug, which provides a quick, effective means of changing positive chokes.

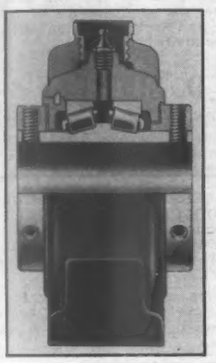
Instead of flanges, the valves are provided with Unibolt couplings, which have been welded on and tested to full-rated test pressure.

Double Interlock Pillow Block Is Built for Simplified Mounting

The new Dodge-Timken double interlock pillow block, manufactured by Dodge Manufacturing Corp., Mishawaka, Ind., was designed for simplified mounting



on ordinary commercial shafting where less heavy loads are to be carried than those requiring the Dodge-Timken clamp-sleeve type of bearing.



This pillow block uses a special duplex Timken roller bearing with long inner race-ring extending completely through the housing, thus providing a completely enclosed bearing. It is made in both expansion and nonexpansion types. In the nonexpansion the inner unit is mounted in a two-piece cast-iron housing with the inside machined truly spherical to fit the outside of the inner unit. In the expansion type the inner unit is mounted in a two-piece cast-iron outer housing with the inside machined with a straight cylindrical bore to fit the outside of the inner unit.

The cap and base are machined at the joint to insure an accurate fit. The base of the outer housing is machined to insure accurate backing, i.e., the distance from the pillow-block base to the center of shaft. All normal radial, thrust and shock loads are successfully carried by this pillow block, but load capacity and top speeds may be increased somewhat if bearings are mounted on shafts ground to full size. Mounting on the shaft is simple.

Hose Specially Made for Bottled Gases Introduced by Goodrich

With the increased use of liquefied petroleum or "bottled" gases, especially in rural areas, the B. F. Goodrich Co., Akron, Ohio, announces a line of butane-

propane hose specially designed to meet the problems of handling these gases. The new hose is of combination construction, with synthetic tube and rubber cover, in sizes ranging from ⅜ in. to 3 in. diameter. All sizes ½ in. and larger have built-in static wire.

One factor which has made these gases safe to use in homes, retail establishments, and industries has been the development of special hose to handle them. The synthetic tube used protects against any action of the gases, while the reinforced wall has been built to withstand all the pressures used.

The ⅜-in. hose is used as a flexible connection in house piping, chiefly in short lengths between storage-tank regulator and permanent piping. The ½-in. to ¾-in. sizes are used as discharge hose for liquefied gas from the delivery trucks to customers' containers; the ¾-in. and 1-in. sizes as return lines between tank cars, storage tanks, and delivery trucks, as a vent for vapor above liquid level to maintain balanced pressure necessary to fill the receiving container.

For conveying liquefied gas from plant storage to tank car and from tank car to local storage and to delivery trucks 1¼-in. and 1½-in. hose generally is used, but in some cases 2-in. and 3-in. diameters are necessary.

Dollars and Sense of Water Cooling

Ingenuity and clarity have been combined in a 24-page booklet, "Dollars and Sense of Industrial Water Cooling," ready for distribution by the Marley Co., Fairfax and Marley roads, Kansas City, Kans. Charts, drawings, and simply worded text present the whole subject of water cooling in an interesting, comprehensive manner.

AMONG EQUIPMENT MEN...

Walker Heads National Supply

A. E. Walker was elected president of the National Supply Co. last week. A native of Detroit, Mich., Mr. Walker received his engineering education at the University of Michigan, graduating in 1910. For 21 years he was connected with Republic Steel Corp. and its predecessor, the Republic Iron & Steel Co., serving as general manager of sales from 1928 to 1936, and was also president of Truscon Steel Co. From January 1937, to April 1939, he served as executive vice president of Pittsburgh Steel Co. April 1, 1939, Mr. Walker was elected vice president and director of the National Supply Co., as well as president of Spang Chalfant, Inc.

Now Export Manager for "Oilwell"

Maurice E. Nicklin has been appointed manager of the export division of Oil Well Supply Co., with headquarters in New York. He succeeds Charles L. Lockett, Jr., who recently resigned.

Mr. Nicklin was born near Oil City, Pa., in 1900. He worked in the oil fields of Pennsylvania and later graduated from Pennsylvania State College with a degree in mechanical engineering. This was followed by 9 years of active oil-field service, sales, and engineering, both domestic and foreign, with Waukesha Motor Co. As export manager for Waukesha. Mr. Nicklin traveled extensively in South America and Europe. He joined "Oilwell" in 1937, continuing in sales and engineering work.

BUSINESS NOTES

Col. W. F. Rockwell, president of Pittsburgh Equitable Meter Co. and Merco Nordstrom Valve Co., has been elected a director of the Commercial National Bank & Trust Co., New York.

The Pittsburgh office of Frick-Reid Supply Corp., has been moved to 305 Ross Street from its former headquarters at 117 Sandusky Street.

Jessel S. Whyte, president of Macwhyte Co., wire-rope manufacturer, Kenosha, Wis., has been elected president of the Kenosha Manufacturers' Association.

Cal M. Shugert has been appointed acting manager of the Gulf Coast division of Security Engineering Co., Inc., with headquarters in Houston, Tex., replacing H. S. Sutton. Mr. Shugert joined Security in September 1939.

Walter W. Trout, of the Lufkin Foundry & Manufacturing Co., was reelected president of the Lufkin, Tex., Rotary Club.

J. V. Jirasek Joins Worthington

John V. Jirasek has joined Worthington Pump & Machinery Corp. as a special representative to the petroleum and chemical industries. He is a graduate in chemical engineering from the University of Prague and did graduate work at the Sorbonne in Paris. A citizen of the United States, Mr. Jirasek in the yast 20 years has been engaged in both the United States and Europe in research, experimental, and development work with leading firms in the petroleum field. Recently he was associated with Compagnie Technique des Petroles, European representative for M. W. Kellogg Co. and with Sharples Corp., of Philadelphia, Pa. Mr. Jirasek's headquarters will be at Worthington's general offices in Harrison, N. J.

Two Are Advanced by Caterpillar

J. D. Fletcher, export sales manager, and T. R. Farley, assistant to the president, have been elected vice presidents of Caterpillar Tractor Co. Mr. Fletcher will continue as head of the export department, the position which he has held 10 years. Mr. Farley, who is abroad studying export markets, will retain his numerous administrative duties.

W. G. L. Smith on Oil-Field Tour

Walter G. L. Smith, president and general manager of E. M. Smith Co., Los Angeles, Calif., manufacturer of Grizzly oil-field products, left Los Angeles by air for Dallas on the first leg of an extended business trip through the country. After spending some time in the various Mid-Continent areas, it was Mr. Smith's plan to fly direct to New York and to visit other important oil districts on the return trip.

Kuhn Made District Sales Manager

Herman J. Kuhn, who has represented the Garlock Packing Co. in Arkansas, Illinois, and Missouri since 1916, has been promoted to district sales manager, with headquarters at 710 St. Louis Mart Building, St. Louis, Mo. F. E. Erlandson, formerly district sales manager in St. Louis, has been transferred to the company's Cleveland, Ohio, offices in the same capacity.

CLASSIFIED ADVERTISING

Patent Attorneys

PATENTS — TRADE MARKS

All cases submitted given personal attention.

Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees"—FREE.

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INFRINGEMENT LITIGATION
Patents, Searches, Opinions, Trade Marks
OFFICES:
311 Panhandle Bldg., Wichita Falls, Tex.
National Press Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

BROKERS and SALESMEN
only
A complete SERVICE EXPERTS in every department of the Oil Business at your SERVICE a REAL SET-UP. The best opportunity ever offered you. Leases in large or small lots at
WHOLESALE PRICES
Write today and get started right.
OIL BROKERS EXCHANGE
Santa Fe, New Mexico.

NEW MEXICO WEEKLY OIL REPORT. Send for sample copy. BOX 968, HOBBS, N. M.

HAVE blocked 4,000 acres in 18-12, Barton County, Kansas. Hess Oil Co., Dwight Building, Kansas City, Missouri.

FOR SALE: Oil and Mineral Lease on TEN THOUSAND ACRES LAND, FIVE MILES WEST OF TEST OIL WELL "Gillican No. 1." Clinch County, Georgia. Chas. E. Stewart, 1217 Hurt Bldg., Atlanta, Ga.

EAST TEXAS Trinity sand wildcats. Major Company blocks will start shortly. Two strikes recently made. Three others likely prospects next Sixty days. If you have some money and sense enough to give these Majors credit for having some sense, there's a likely chance you might make some quick money.
E. CROFT
Proctor, Texas.

ILLINOIS BASIN. First Sand at 500 ft. 50 to 60 bbls. flush, 38 gravity. Second and third pay 1200 and 2100 ft. I furnish lease, drill, complete one well to first sand, assign all for $3000.
H. B. BUDDENBORG
Carlinville, Illinois.

FOREST CITY BASIN. NE Kansas Oil leases near well location. Harry Haynes, Grantville, Kansas.

CRANE-WARD County 20 ac. cheap in fee, under Magnolia lease. J. G. Smith, 215 Littlefield Bldg., Austin, Texas.

WATCH GEORGIA—Geology-Geophysics working—Drilling—Sands — Traces — For drilling deals write C. W. Deming, Reg. Dealer, Waycross, Georgia.

2,600 ACRES oil lease one year free for an oil test. Give reference. Box 362, Merkel, Taylor Co., Texas.

CRUDE OIL, large amounts Mississippi, Texas. Refinery, dealer buyers wanted. J. L. Arlitt, 17 East 42nd, New York, N. Y.

690 ACRES raw land near Gore, Okla., $3.50 acre. With all mineral rights. 315 Alexander Building, Tulsa, Oklahoma.

FOR SALE: 10 acres in Atoka Co., Oklahoma. NE¼, SW¼, SE¼, Sec. 9, Twp. 4 South, Range 13 East. James C. Barry, 3505 Legation St. N. W., Washington, D. C.

EX-GEOLOGIST sells and trades drilling rigs, oil leases, farms properties; tests arranged. A. B. Nickell, Fayette, Mo.

Leases and Drilling Blocks

FOR SALE Oil and gas leases and small production located in Kentucky shallow field, and leases located in Clay County, Tenn. Have for sale two tracts of proven Fluorspar and Zinc deposits; reports furnished on request. W. P. Harley, Bowling Green, Kentucky.

NEW MEXICO
STATE OIL AND GAS LEASES
40 acres and multiples thereof. $6.00 to $60.00 per forty. Buy direct. Save those dollars. No middle man to pay; no salesman to bother you! Twenty years in the business without a complaint. Write for information.
HARRY S. WRIGHT
New Mexico State Lessee
Wright Bldg., Farmington, New Mexico.

WELL LOGS. Drillers' logs of approximately 4,000 wells drilled in New Mexico are available from Well Log Division, New Mexico Bureau of Mines & Mineral Resources, Socorro, New Mexico. Write for price list C.

ATTENTION Drillers and Contractors—A fine proposition for a well in Idaho, for immediate action. Shallow wells show oil and gas. Communicate with Lafe Boone, Route 2, Boise, Idaho.

WILL buy producing oil payments in Illinois basin. Give full details, location, price, etc. A. E. Butterfield, 215 E. Main, Olney, Illinois.

WEST TEXAS OIL LEASES
AND ROYALTIES
If you wish to buy or sell producing or Non-producing oil leases or royalties located in West Texas or Eastern New Mexico; Address:
AMERICAN NATIONAL BROKERAGE CO.
Post Office Box 516
Levelland, Texas.

WE OWN THE FOLLOWING
CUBAN OIL LEASES:
A—30 year lease 864 hectares in noted Bacuranao section 3000 meters bordering Gulf of Mexico with riparian rights. Sixteen miles from Havana.
B—30 year lease 250 hectares that adjoins Union Oil Company—10 Miles from Havana and one mile from Gulf.
C—30 year lease two 50 hectare tracts near Mantanzas.
If interested write
W. D. STRONG
Box 401, Miami, Florida.

I HAVE a partially developed 160-acre oil lease with 11 producing oil wells that is practically offset by two successful water-flooding projects in the same sand. Will sell or will develop on a 50-50 basis. F. W. Black, Paola, Kansas.

Leases and Drilling Blocks

LEASE: 400 acres, 12-5-7, 3½ miles Pure Marshall County discovery well. Owners, Allen Hill, Durant, Okla.

FOR complete and accurate coverage of the new Artesia Area, read The ARTESIA (New Mexico) ENTERPRISE. $2 a year.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla, Kans, N. Mex, Tex, Ala, Ark Fla, Ga, Ill, Ind, Ky, La, Mich, Miss, Mo Neb, N. Dak, Tenn, Wyo. Free catalog, samples on request. Burkhart Ptg. & Sta Co. 115 S. Cinn, Tulsa, Oklahoma.

Wanted

WANT financing for new patents on oil field equipment. You will share in royalties on existing patents. No brokers. Address Box K-563, The Oil and Gas Journal, Tulsa, Oklahoma.

Ranches—Farm Lands

ONE of best fee land deals in Texas. 9u to 640 acres, only $1 acre down balance 40 years. Oil possibilities. American Investment Co., Houston, Texas.

Survey Service

REMEMBER EAST TEXAS
When all other methods fail, employ my divining or dowsing method. If oil exists this method finds it. Faults, broken treacherous areas accurately defined. Our Watson #2, first producer Wilmington, Calif. field, located by this method. More reliable than mechanical geophysics. Ask any unbiased oil authority. Many years' experience. A wise man investigates. George Miller. 1548 Post, Torrance, California.

Geophysical Service

PROFITS in the Oil Business come from accurate location of new oil pools. Let us show you how. Gravitational Selector Company, 14957 Lakewood Heights Boulevard, Lakewood, Ohio.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G Guyer, Inc., Wilmington, Delaware.

CHARTERS — Delaware best, quickest, cheapest, more liberal. Free forms. Colonial Charter Co., Wilmington, Del.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Inquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

PURCHASERS AND DISTRIBUTORS
PRODUCING ROYALTIES
Registered with S. E. C.
INVESTMENT ROYALTIES, LTD.
Ramsey Tower, Oklahoma City, Okla.

WILL purchase limited amount producing royalty. priced right, and to bear strictest investigation. Box 240, Pauls Valley, Okla.

For Sale—Maps

R. B. ROBINSON MAPS
Jackson, Miss. 3-Hart Bldg., Across Street from Heidelberg Hotel. Ownership maps All Over Mississippi.

1940 OIL AND GAS FIELD MAP
Texas, Eastern New M. Price $1.00.
Wildcat Map $3.00 Published monthly.
ZINGERY OIL MAP CO., Fort Worth, Tex.

Mailing Lists

ROYALTY Lists. Oil Investor Lists. Stockholders Lists. By States. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa.

ROYALTY, lease and oil investors in any state. Catalogue. Flory Co., Box 105. Fort Worth, Texas.

Real Estate

FOR LEASE — Five to 10 years, shop now being used by Hydril Co.; two or more acres, all steel building with 15-ton crane, trackage, office building, all utilities, etc. Available May 15.
M. R. DUCEY, Owner
309 Webster, Houston, Texas.

Financing

CAPITAL SEEKERS
Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

JOHN MORRIS, Box 5411, Philadelphia, studied records 5000 financial houses. Found only 191 buy new issues. $4.00.

Help Wanted

PETROLEUM Engineer with successful sales experience in oil well pumping equipment. Preferably under 35 years of age. Qualifications and full particulars desired in first letter. Strictly confidential. Address Box K-491, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMIST with degree from a university and at least three years' experience in a petroleum refinery control laboratory desired by a modern central state refinery. Address Box K-542, The Oil and Gas Journal, Tulsa, Oklahoma.

REPRESENTATIVES WANTED in different oil field territories, to sell several patented articles away ahead of anything on the market. Require $700, coupe and good references. Should make $1000 a month. P. O. Box 142, Tulsa, Oklahoma.

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Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

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3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
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5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

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1 Inch	26 times	4.00 per inch
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This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

Situations Wanted

REFINERY Process Engineer, Chemical Engineer, 20 years diversified industrial experience including process research, development, design, consultation, refinery operation. Capable executive; excellent record in handling labor and lowering production costs. Outstanding ability to analyze refinery requirements and processes. Desires position as refinery executive in operation or engineering. Address Box K-534, The Oil and Gas Journal, Tulsa, Okla.

COMPETENT Material Man, Warehouseman and Production Man desires connection. College Graduate. Go any place. Address 3017 East Third, Wichita, Kansas.

GRADUATE CHEMIST, 4 yrs.' experience laboratory research, engineering design, construction and operation of catalytic refg. proc. Familiar with ref. oper. Excellent references. Address Box K-564, The Oil and Gas Journal, Tulsa, Okla.

Situation wanted by graduate petroleum geologist with invaluable experience in both geology and land work. Young man capable of advancement desirable for an independent company. Excellent references. Address Box K-566, The Oil and Gas Journal, Tulsa, Oklahoma.

DESIRE connection with sales organization of manufacturer of equipment for the oil and gas industry. Well qualified by technical training and twelve years as refinery superintendent and engineer to competently handle sales engineering work. Address Box K-567, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATION WANTED: Either general or exclusive territory representation oil field specialty manufacturer. 15 years experience entire Mid-Continent area as division sales manager major drilling machinery manufacturer. Recently operated small progressive oil field supply company. Address Box K-568, The Oil and Gas Journal, Tulsa, Oklahoma.

COMPETENT, successful Manager: For Oil Company, Drilling Contractor or extensive oil interests. 20 years' experience If your operations are not showing sufficient profit write P. O. Box 134, South Pasadena, California.

E. E. with thorough experience design of lines, generating equipment, load tests for motor size and counter-balance necessary for well pumping. Experienced construction lines, installation switches, motors, maintenance equipment, rewinding motors, and rebuilding transformers. Address Box K-570, The Oil and Gas Journal, Tulsa, Oklahoma.

For Sale—Equipment

FOR SALE: Now erected Oklahoma City field, one type T-19-3-B Pritchard and one Model 21-ZA-9 Fluor Cooling towers. I.T.I.O., Bartlesville, Oklahoma.

FOR SALE: In Oklahoma City field, 10 twin type 80 horizontal cooper single acting 4 cycle engine compressors, Indian Territory Illuminating Oil Company, Bartlesville, Oklahoma.

500,000 TONS Texas Granite, for sale cheap, suitable Buildings, Monuments, Roads, Levees, Jetties, Seawalls. Indestructible. Brokers protected. J. L. Arlitt, 17 East 42nd, New York, N. Y.

FOR SALE: At Seminole 15,000 Ft. good used ⅞ x 25' double sucker rods. I.T.I.O. Co., Bartlesville, Okla.

For Sale—Equipment

For Sale—Equipment

For Sale—Equipment

LIQUIDATING—BARNSDALL REFINERY—OKMULGEE, OKLAHOMA

2500 bbl. thruput cracking—6000 bbl. topping and cracking. Original cost $600,000.00—Units complete in every respect. Turbine driven hot oil pumps—Priced for immediate sale. Will dismantle and load for reerection, or will take turnkey job for dismantling and reerection your site.

WIRE *PHONE* *WRITE*

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

FOR SALE cheap at Oklahoma City, 16" O.D. 28# and 20" 35# Naylor Plain end Spiralweld pipe, suitable for surface pipe. I.T.I.O. Company, Bartlesville, Oklahoma

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
16 West 2nd St., Cincinnati, Ohio

FOR SALE: Orifice and Positive Gas Meters. GEO. R. MILNER, Okmulgee, Oklahoma.

FOR SALE at Oklahoma City Warehouse, large quantity 4¾" o.d. 16#, 5" o.d. 15# slotted-perforated liner and Stanciff screen pipe. I. T. I. O. Company Bartlesville, Okla.

FOR SALE: 1500 bbl. oil refinery located Chicago area, now operating on Illinois crude oil. Complete pipe still, tankage, treating equipment, truck and tank car loading facilities, etc. Established business and complete organization. Price $25,000. Address Box K-552, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE
COMPRESSORS

From 100# to 2,000# discharge pressures in capacities from 100 cu. ft. to 3000 cu. ft. per minute either belted or direct connected gas, electric or Diesel types.

ELECTRIC MOTORS
25 Cycle to 60 Cycle
From 5 to 250 HP

ENGINES
Gas & Diesel
From 25 to 500 HP

PULLEYS
Split steel, all sizes.

L. F. SMITH COMPANY
217 W. Archer
Tulsa, Oklahoma

We guarantee the condition of all equipment rebuilt in our shops.

FOR SALE—8,000 ft. 4" standard pipe 30 ft. lengths. Plain end. Good condition. Price 15c. M. J. Regan, Coffeyville, Kans.

Mobil Gas and Mobil Oil
LUBRICATING GAS-O-LINE
ORIGINAL AND GENUINE
ADMIXTURE
Solvent Knock and Ring Prevents Gum — Lead Action
Corrects Sticky Valves and Carbon Troubles
For the 25-hr. "Sticky Carburetor" tests Chevrolet, Ford, Plymouth, Dodge, Desoto, Studebaker, Buick, Oldsmobile, Pontiac, Hudson, Nash, Packard, Cadillac, LaSalle, Lincoln Zephyr, Graham, Terraplane, Willys, Auburn, Cord, Reo, Diamond T, Mack, Federal, G.M.C. Trucks, Ford V-8, Chevrolet Master

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